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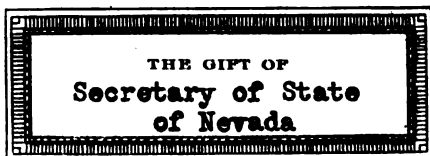
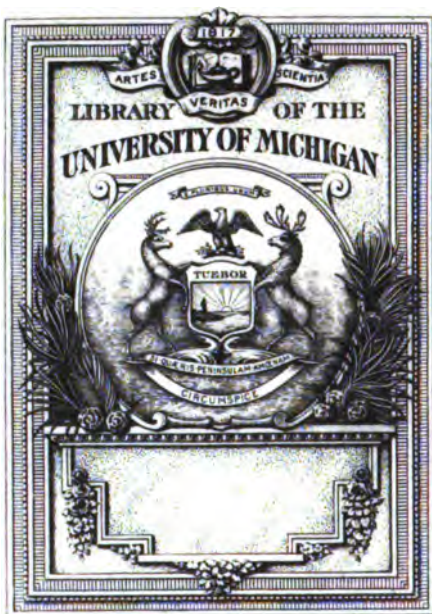
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APPENDIX
TO
Journals of Senate and Assembly
OF THE
THIRTIETH SESSION
OF THE
Nevada. **LEGISLATURE OF THE STATE OF NEVADA**
1921

VOLUME II



CARSON CITY, NEVADA
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UNIVERSITY OF NEVADA

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RENO, NEVADA, 1919

CANNING, PRESERVING AND JELLY-MAKING

By
MARGARET M. JOHNSON,
State Club Leader

Designed Primarily for Boys and Girls
Club Work



State Champion Canning Team, 1918

Printed at the
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CANNING, PRESERVING, AND JELLY-MAKING



Washoe County Canning Team

FRUITS AND VEGETABLES are necessary every day in the year to keep our bodies perfectly healthy. Unfortunately, green vegetables, which are most important for health, are eaten by many people only during the short summer season, because it is too expensive to get them fresh from the market in winter. Canning the surplus products makes possible the use of

fruit and green vegetables the entire year, thus increasing the health and happiness of the home.

Food products spoil in a short time, if left in their natural state, because they are attacked by bacteria, molds, or other organisms which are always present in the air. In the process of canning, these organisms are killed by heat and the jar is sealed tightly so that others cannot enter. Therefore, products properly canned will keep indefinitely.

The advantages of the one-period cold-pack method of canning over other methods are as follows: (1) It simplifies home canning, because practically all fruits and vegetables may be canned according to one set of directions, thus avoiding the many recipes required by other methods; (2) it is more certain than other methods; (3) it saves time and labor; (4) it produces a product having a better shape, color, and flavor than is produced by any other method.

CANNING EQUIPMENT

Certain articles of equipment are necessary in the cold-pack method of canning. These are a canner, jars with lids, rubber rings, pans or kettles for preparing, blanching, and cold-dipping the products, a strainer or colander, measuring cups and spoons, paring knives, cheese-cloth or wire basket for use in blanching, towels, a duplex fork or other device for lifting the hot jars, a stove, and plenty of hot and cold water.

CANNERS: *Hot-Water Canners* may be made of washboilers, lard cans, new garbage pails, metal washtubs, tin pails, or any vessel that has a flat bottom and a tight-fitting lid and is deep enough to allow the jars to be covered with water. A rack of wood, wire, or metal must be placed in the bottom of the canner to support the jars, to prevent direct contact with the heat, and to allow a free circulation of water under the jars. This rack should be at least three-fourths of an inch from the bottom of the canner. Handles placed upon the ends of the

rack aid in lifting the jars in and out of hot water. Figure 1 shows two home-made canners—one made of a garbage pail and the other of a soup kettle. The racks are made of galvanized iron.

Aluminum Pressure Cookers may also be used for home canning. The one shown in Figure 2 is made entirely of aluminum and will carry as high as thirty pounds steam pressure. It is equipped with a steam-pressure gage, safety valve, and petcock. Under pressure the temperature is raised to many degrees above the boiling-point. The higher

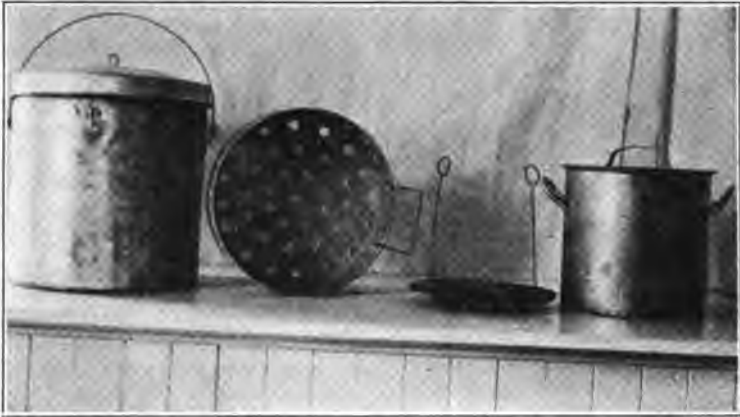


Figure 1

temperature destroys bacteria and cooks the product more quickly than the boiling temperature. The pressure cooker is very convenient to use for canning in high altitudes because it saves the time and fuel necessary for the long processing in the hot-water canner.

THE JARS used in canning should be smooth, well finished, and made of good quality of glass. The size of the jars used should be determined by the size of the products to be packed, the quantity desired when the jar is opened, and the ease of sterilization. They should be examined carefully before using them, and all those which are cracked or defective in any way should be discarded. Pass the finger around the place where the rubber fits, and if there are any sharp edges, file them down with a file or the back of a knife-blade. The lids should fit perfectly. Since the method by which a jar is sealed is more important than the jar itself, jars are usually named according to the method of



Figure 2

sealing. Three types of jars are shown in Figure 3: (a) the screw top, (b) the glass or clamp top, and (c and d) the vacuum-seal top.

(a) *Screw-Top Lids* which are discolored or corroded or which have bent edges or in which the lining is cracked should not be used. Bacteria collect in and under cracks in the lining, and are almost impossible to remove. Pass the finger over the edge of the lid, and if there

are any sharp points that might cut the rubber, file them down with the back of a knife-blade. Test the fitting of a screw-top lid as follows: (1) Screw the lid tight on the jar without the rubber ring and try to insert a thin knife-blade between the top and the glass. If this can be done, the lid does not fit properly. (2) Place water in the jar, put on the rubber, screw the lid down tight, invert the jar and shake. If the water comes out, the lid does not fit tightly.

(b) *The Glass or Clamp-Top Lid* must be free from cracks. It must not rock back and forth on the jar when the upper bail is over it and the lower bail is up. The upper bail should go over the lid with a snap, even when the lower bail is up. The lower bail must go down with a snap. If the bails do not snap when put in place, remove the upper bail and bend it down in the middle by pushing up on each end. Replace and test again. If the upper bail goes down too tightly so that



Figure 3

(a) Screw Top. (b) Glass or Clamp Top. (c and d) Vacuum-Seal Tops

there is danger of breaking the lid, loosen it up by pushing it down on each end, thus bending it up in the middle.

(c and d) *Two Kinds of Vacuum-Seal Jars* are shown in Figure 3; (c) shows the lid fastened with a screw-band and (d) the lid fastened with a clamp. The screw-band or the clamp is not necessary after the lid is sealed to the jar. They simply hold the lids in place while processing the jars of product. The clamp may be tightened if necessary by pushing up on each end, thus bending it down in the middle. The composition on vacuum-seal lids must be smooth, thick and even. Vacuum-seal lids can never be used but once, therefore new ones must be purchased each year.

RUBBER RINGS: It is probable that more products are lost in canning because of the use of imperfect rubber rings than from any other cause. *Every rubber ring should be tested as follows before using it:* (a) By stretching—Hold the ring in the tips of the fingers and give it a firm strong pull; (b) By twisting—Fold the ring and twist tightly, holding the folds in tips of the fingers; (c) By folding—Fold the ring in several places. The ring should not crack or break and should return to its original shape after each test. Rubber rings which stand the above tests may be safely used, regardless of color or kind. Rubber rings should have an inside diameter of $2\frac{1}{4}$ inches, should be $\frac{5}{16}$ of an inch wide and $\frac{1}{12}$ of an inch thick.

DIRECTIONS FOR CANNING

The general steps in the one-period cold-pack method of canning are as follows: (Variations will be noted under the different products.)

1. Selection of Product.
2. Preparation of Utensils and Equipment.
3. Preparation of Product (grade, wash, trim).
4. Blanching or Scalding of Product.
5. Cold-dipping of Product.
6. Packing of Product.
7. Addition of Hot Syrup or Salt and Boiling Water.
8. Partial Sealing of Jars.
9. Sterilizing of Product.
10. Removal from Canner and Sealing.
11. Cooling.
12. Testing.
13. Labeling.
14. Wrapping and Storing.



State Champion
Canning Club
Member, 1918

SELECTION OF PRODUCT: Products for canning should be firm, sound, ripe, and absolutely fresh. Fruit should be canned the same day that it is picked. Vegetables should be canned not later than five hours after picking. Peas, beans, corn, and asparagus are especially hard to keep, therefore great care must be taken in canning them. They are apt to "flat sour"—that is, develop a peculiar sour metallic flavor if they are not canned soon after picking or if they are not packed immediately after they are blanched and cold-dipped. Flat sour does not cause the product to look spoiled, therefore cannot be detected until the jar is opened.

PREPARATION OF UTENSILS AND EQUIPMENT: An abundance of hot and cold water must be on hand. The water in the canner and in the blanching kettle should be placed to heat so that it will be boiling when ready to use it. The syrup for fruits should be made. The jars, lids, and rubbers should be tested as directed under "Equipment." The jars and the glass and screw-top lids should be washed and placed in a pan of cold water and heated to the boiling point. The rubber rings and the vacuum-seal lids should be placed in a pan of cold soda water ($\frac{1}{8}$ teaspoon of soda to a pint of water). All utensils should be clean and sanitary and should be placed ready for use so that the product may be canned as quickly as possible after starting the process.

PREPARATION OF PRODUCT: The product should be thoroughly washed and all dirt and grit removed. Spinach and other greens must be washed many times. A strainer or colander is best to use for washing fruits and most vegetables.

Most vegetables or fruits need to be trimmed in some way—that is, shelled, strung, stemmed, scraped, pitted, or cored. All unsound or hard parts should be removed.

Fruits and vegetables should be graded—that is, separated according to size—the large parts being canned in one jar and the small ones in another jar; and according to color, as in canning white and yellow peaches; and according to degree of ripeness.

BLANCHING consists in immersing the product in boiling water and leaving it there for a definite length of time or in steaming it over

boiling water. When the product is placed in boiling water the temperature is lowered so that the water stops boiling for a short time. Do not begin to count the time for blanching until the water is boiling. (Water is boiling when large bubbles are breaking over the entire surface and the water is jumping.) A square of cheesecloth or a wire basket may be used to hold the product while blanching and cold-dipping it. It is best to blanch spinach and other greens by steaming them, because if they are placed in boiling water they will become soft and lose their valuable mineral salts. Green vegetables may also be steamed if desired. Soft fruits such as berries are not usually blanched. The reasons for blanching are as follows: (a) To shrink the product, thus allowing more to be packed in a jar and preventing shrinkage during sterilization; (b) to start the flow of coloring matter, thus making the product a better color; (c) to aid in sterilizing the product, and (d) to remove undesirable acids and flavors.

SCALDING: Some products are scalded instead of blanched before canning them. Scalding consists in dipping the product up and down in boiling water. Peaches, apricots, and tomatoes are usually scalded because if left in the boiling water they are apt to become soft. Scalding loosens the skin and makes it come off easily.

COLD-DIPPING consists in dipping products up and down in clean cold water. All products should be cold-dipped immediately after blanching. Do not let them stand in the cold water, but dip them up and down several times and then remove them. The temperature of the water used for cold-dipping should be as low as possible. The reasons for cold-dipping are: (a) To help cleanse and sterilize the product; (b) to aid in shrinking it; (c) to set the coloring matter; (d) to cool the product, and make it firm and easy to handle.

Blanch and cold-dip only enough of any product to fill a few jars at a time or what can be handled quickly.

PACKING: Immediately after blanching and cold-dipping the product, it should be packed in hot jars which have been tested and sterilized as directed. Pack it carefully and closely without crushing. Pack quickly. A thin flexible paddle made of cane or other suitable wood is useful in placing products in the jars, otherwise a fork or spoon which does not tarnish easily may be used. Fill the jars completely, except in canning peas and corn. As these swell during sterilization, it is best to leave one-half inch of space at the top of the jar. For exhibit purposes products may be packed in different fancy ways, but for common use the close pack of smaller pieces is best.

FILLING: Add one level teaspoon of salt to each quart of vegetables and fill to overflowing with boiling water. To fruits add boiling syrup made according to directions given under *Syrup*, using thin, medium, or thick syrup as desired.

PARTIAL SEALING: Carefully wipe off the top of the jar, and put on it a tested rubber, if using a jar that requires a rubber. If using a screw-top lid, screw it on tight and then make a slight turn back to loosen it. If a glass-top lid with clamp is used, place the upper bail over the top of the lid and leave the lower bail up. Place vacuum-seal lids in position and fasten tightly with a clamp or a screw band. They do not seal to the jar until toward the end of sterilization period. Jars must not be sealed tightly when placed in the canner, because the contents

expand when heated, taking up more room and some of the liquid and steam must escape or the jar will break.

STERILIZATION: *In Hot-Water Canner.* The water in the canner must cover the tops of the jars at least one inch. If the water is not boiling when the jars are put in, do not begin to count the time until it is boiling. Keep the water boiling all the time. If for any reason it stops boiling, stop counting the time until it boils again. Do not crowd the jars too closely together or they may break in the process of sterilization. For the length of time necessary to sterilize any product consult Tables I and II, and also the directions for increasing the time for high altitudes.

In Steam-Pressure Cooker: The water should come to the rack in the bottom, but not above it. When all the jars are in, fasten all the clamps partially, then tighten each one fully. Moist air will come out through the petcock at first. Let it remain open until dry live steam escapes from it. Then close it completely. When the hand on the pressure gage indicates the required pressure, begin to count the time. Vegetables may be canned at ten pounds pressure, but fruit should be canned at a pressure not higher than five pounds. Decide on the pressure to be used and keep the indicator at this point throughout the canning process. This may be done by turning the flame up or down under the canner or by moving the canner on and off the stove. If the pressure goes up and down during the canning process, liquid will be lost from the jars. When the product has sterilized the required length of time, turn out the flame or remove the canner from the stove. Allow it to cool until the indicator registers zero before opening the petcock. Open the petcock and allow the steam to escape. No increase of time is necessary for altitude when using the steam-pressure cooker.

SEALING OF JARS: As soon as the jars are removed from the canner complete the seal of the screw-top lids by turning them as tight as possible. Push down the lower bail on the clamp-top lids. Do not twist the screw band or disturb the clamp of the vacuum-seal jars, for there is danger of breaking the seal. Do not remove the lids from jars after sterilizing unless the lid or rubber is defective. (See under "Testing.")

COOLING: Turn jars having glass or screw tops on the side to cool, but do not turn vacuum-seal jars on the side. Leave them upright. Cool jars quickly, but do not place them in a draft. Cover with a cloth to prevent cracking, if there is danger of cold air striking them.

TESTING: Turn screw-top and glass-top jars upside down to test the seal. If there is any leak, determine the cause, replace defective lid or rubber and resterilize fruit five minutes and vegetables ten minutes. Do not turn vacuum-seal jars upside down to test. Let stand until the following day, then remove clamp or screw band and lift jar by lid. If seal is defective, place on new lid and resterilize as given above.

LABELING: It is a good plan to place on the jar of product at least the name of it and the date when canned. If for exhibit purposes 4H club labels should be filled out and used.

STORING: Canned products should stand at least twelve hours before storing. They should then be wrapped in paper to prevent bleaching. They should be stored in a clean, dry, cool place. Stored products should be examined occasionally to see if they are keeping well.

TABLE I

**Time Table for Blanching, Scalding, and Sterilizing Fruits, Vegetables,
Meats and Soups**

(Time of Sterilization in the hot-water canner is for sea-level or 500 feet above)

Products	Blanch or scald	Time of sterilization		
		Hot-water canner*	Steam pressure, 5 pounds	Steam pressure, 10 pounds
Soft Sweet Fruits—				
Apricots	1 to 2 minutes	16 minutes	10 minutes	5 minutes
Berries		16 minutes	10 minutes	5 minutes
Cherries		16 minutes	10 minutes	5 minutes
Figs	1 to 2 minutes	16 minutes	10 minutes	5 minutes
Grapes		16 minutes	10 minutes	5 minutes
Peaches	1 to 2 minutes	16 minutes	10 minutes	5 minutes
Plums	1 to 2 minutes	16 minutes	10 minutes	5 minutes
Soft Sour Fruits—				
Currants		16 minutes	10 minutes	5 minutes
Gooseberries	1 to 2 minutes	16 minutes	10 minutes	5 minutes
Rhubarb†	1 to 2 minutes	16 minutes	10 minutes	5 minutes
Hard Fruits—				
Apples	1½ minutes	20 minutes	10 minutes	5 minutes
Pears	1½ minutes	20 minutes	10 minutes	5 minutes
Quinces	1½ minutes	20 minutes	10 minutes	5 minutes
Fruit Juices		30 minutes	10 minutes	5 minutes
Pod - Vegetables—				
String beans	5 to 10 minutes	120 minutes	60 minutes	40 minutes
Lima beans	5 to 10 minutes	180 minutes	60 minutes	40 minutes
Okra	5 to 10 minutes	120 minutes	60 minutes	40 minutes
Peppers	5 to 10 minutes	120 minutes	60 minutes	40 minutes
Peas	5 to 10 minutes	180 minutes	60 minutes	40 minutes
Root - Vegetables—				
Beets	5 to 10 minutes	90 minutes	60 minutes	40 minutes
Carrots	5 to 10 minutes	90 minutes	60 minutes	40 minutes
Parsnips	5 to 10 minutes	90 minutes	60 minutes	40 minutes
Salsify	5 to 10 minutes	90 minutes	60 minutes	40 minutes
Sweet potatoes	5 to 10 minutes	90 minutes	60 minutes	40 minutes
Turnips	5 to 10 minutes	90 minutes	60 minutes	40 minutes
Greens—				
Spinach	15 minutes	120 minutes	60 minutes	40 minutes
Swiss chard	15 minutes	120 minutes	60 minutes	40 minutes
(All other greens the same)				
Unclassified Vegetables—				
Asparagus	3 to 5 minutes	120 minutes	60 minutes	40 minutes
Cabbage	5 to 10 minutes	120 minutes	60 minutes	40 minutes
Caniflower	3 minutes	60 minutes	30 minutes	20 minutes
Corn (sweet)	5 to 10 minutes	180 minutes	90 minutes	60 minutes
Corn (field)	5 to 10 minutes	180 minutes	90 minutes	60 minutes
Egg-plant	5 to 10 minutes	120 minutes	60 minutes	40 minutes
Pumpkin	3 minutes	120 minutes	60 minutes	40 minutes
Squash	3 minutes	120 minutes	60 minutes	40 minutes
Tomatoes	1½ minutes	22 minutes	15 minutes	10 minutes
Meats—				
Uncooked		180 minutes	120 minutes	60 minutes
Partially cooked by frying, baking, boiling or roasting.		90 minutes	60 minutes	40 minutes
Soups				
		90 minutes	60 minutes	45 minutes

*The time of sterilization given in the above table is for quart jars canned at sea-level and up to 500 feet above. The same time may be used for pint jars. See below for increase of time for altitude. Also consult Table II.

†Rhubarb may be classified here as a fruit since it is treated as one in canning.

Increase of Time for Altitude Changes

The time of sterilization given in the above table for the hot-water canner is for altitudes from sea-level to 500 feet above sea-level. For higher altitudes increase the time given in the table 10% for every 1,000 feet above 500 feet. For instance, the altitude of Reno is 4,500 feet. Subtracting 500 feet leaves 4,000 feet, for which the time is to be increased 10% for each thousand feet. Therefore, the time given in the above table for the sterilization of any product must be increased 40% at Reno.

The reason for increasing the time of sterilization for (increase in

altitude is because the boiling-point of water becomes lower as the altitude becomes higher, decreasing at the rate of 2°F. for every 1,000 feet increase in altitude. If the boiling-point is low, products cook at a low temperature and must therefore cook a long time before they are done. The boiling-point of water at different altitudes is approximately as follows:

<i>Altitude</i>	<i>Boiling-point</i>	<i>Altitude</i>	<i>Boiling-point</i>
Sea-level	212°F.	3,000 feet.....	206°F.
500 feet.....	211°F.	4,000 feet.....	204°F.
1,000 feet.....	210°F.	5,000 feet.....	202°F.
2,000 feet.....	208°F.	6,000 feet.....	200°F.

The time for sterilization in the steam-pressure cooker does not need to be increased for altitude changes, because the pressure inside raises the boiling-point to the same high temperature regardless of altitude.

In Table II the time given for sterilization of different products at sea-level has been increased according to the above rule for the altitudes indicated.



**Second and Third Canning Club Members
in the State, 1918**



Members of Churchill County Canning Teams, 1918

TABLE II
Table Showing Change of Time for Increase in Altitude

Time in minutes for sterilization at the altitudes given

Time given in first table for sea-level or 500 feet	Time in minutes for sterilization at the altitudes given													
	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000	6500	7000	7500
16 minutes	16.8	17.6	18.4	19.2	20.	20.8	21.6	22.4	23.2	24.	24.8	25.6	26.4	27.2
20 minutes	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.	32.	33.	34.
22 minutes	23.1	24.2	25.3	26.4	27.5	28.6	29.7	30.8	31.9	33.	34.1	35.2	36.3	37.4
30 minutes	31.5	33.	34.5	36.	37.5	39.	40.5	42.	43.5	45.	46.5	48.	49.5	51.
40 minutes	43.	46.	49.	52.	55.	58.	61.	64.	67.	70.	73.	76.	79.	82.
60 minutes	63.	66.	69.	72.	75.	78.	81.	84.	87.	90.	93.	96.	99.	102.
90 minutes	94.5	99.	103.5	108.	112.5	117.	121.6	126.	130.5	135.	139.5	144.	148.5	153.
120 minutes	126.	132.	138.	144.	150.	156.	162.	168.	174.	180.	186.	192.	198.	204.
180 minutes	189.	196.	207.	216.	226.	234.	243.	252.	261.	270.	279.	288.	297.	306.

Consult Table I for the time to sterilize any fruit or vegetable at sea-level or 500 feet above. Then find the time in this table under the altitude of your locality which corresponds to that time. For instance, if you are canning fruit at an altitude of 3,500 feet, consult Table I for the time to can fruit at sea-level. You find this to be 16 minutes. Then look in the column under 3,500 feet in the line corresponding to 16 minutes, and you find the time to sterilize fruit at an altitude of 3,500 feet is 20.8 minutes.

Use the time given for the altitude which is nearest to your exact altitude. That is, if your altitude is 3,800 feet, use the time given for 4,000 feet.

FRUITS

For convenience in canning, fruits are divided into soft fruits and hard fruits. Soft fruits are subdivided into sweet fruits and sour fruits.

SOFT SWEET FRUITS are *cherries, grapes, apricots, peaches, figs, plums* and all kinds of sweet *berries*.

Cherries, grapes, and berries are usually canned without blanching or cold-dipping them. If, however, they can be scalded one minute without making them too soft and juicy, and are then cold-dipped, enough can be packed in a jar to prevent the fruit rising to the top during sterilization and causing an excess of juice in the bottom. Select fresh sound fruit. Wash it by placing it in a colander or strainer and pouring cold water over it. Stem or pit as is necessary, at the same time grading it for size and ripeness. If not blanched, pack immediately into hot sterilized jars. It can be packed more tightly by putting a few pieces into the jar at a time and pressing them down, than by filling the jar loosely and then shaking it. Add hot syrup enough to fill the jars. Use a thin or medium syrup. (See *Syrup*.) Wipe off the top of the jar with a clean cloth, place rubber and top in position, partially seal and place in the canner for the required length of time. (See Tables I and II.) Remove from canner, tighten seal, cool, test, label, wrap, and store.

Apricots, figs, peaches, and plums should be ripe, but perfectly sound. Wash them and grade for size, perfection, ripeness, and color. Place in cheesecloth or wire basket, and scald from one to two minutes. Cold-dip, then remove the skins. Cut peaches and apricots into halves and remove pits. Plums and figs may be canned whole or in halves. Pack at once into hot sterilized jars. A thin flexible paddle made of cane or other suitable wood is very useful in placing fruit in jars. Place the halves in overlapping layers with hollow parts down and toward the center of the jar. Fill jars with thin or medium syrup. Adjust rubber and top, partially seal, place in canner, and sterilize the required length of time. (See Tables I and II.) Remove, complete the seal, cool, and test. Label, wrap, and store.

SOFT SOUR FRUITS include *currants, gooseberries, sour cherries, and cranberries*. *Rhubarb* may also be classed as a soft sour fruit. Select sound, fresh, ripe fruit. Wash in strainer, stem, and grade. Cut rhubarb into pieces. Blanch one to two minutes and cold-dip. Pack closely in hot sterilized jars. Add boiling thick syrup. (See *Syrup*.) Adjust rubber and top, and partially seal. Sterilize the required length of time. (See Tables I and II.) Remove, tighten seal, cool, and test. Label, wrap, and store.

HARD FRUITS such as *apples, pears, and quinces* should be washed, pared, and cored. They may be left whole or cut in halves, quarters, or slices. Drop pieces into cold salt water to prevent turning brown (1 teaspoon salt to 1 gallon of water). Blanch 1½ minutes and cold-dip. Pack in hot sterilized jars, placing halves in overlapping layers with hollow parts down and toward the center of the jar. Add thin or medium syrup. Adjust rubbers and tops, and partially seal. Sterilize the required length of time. (See Tables I and II.) Remove from canner, complete the seal, cool, and test. Label, wrap, and store.

The Syrup used in canning fruit may be thin, medium, or thick,

according to individual taste or the sweetness or sourness of the fruit used. In general, thin syrup is used for quite sweet fruits, medium syrup for medium sweet fruits, and thick syrup for sour fruits. Make the syrup by dissolving the sugar in boiling water and boiling it for 5 minutes. The proportions for the three kinds of syrups are as follows:

Thin syrup—1 cup sugar to 2 cups water.

Medium syrup—1 cup sugar to 1 cup water.

Thick syrup—2 cups sugar to 1 cup water.

Boiling water may be used instead of syrup in canning fruit, but the flavor of the fruit will not be so good. If fruit is canned without sugar, it should be sterilized 5 minutes longer than the regular time given.

FRUIT JUICES*

The juices of such fruits as grapes, berries, and cherries make a delicious and wholesome drink, and should be more widely used in the home. The flavor of these juices is finer when they are sterilized below the boiling-point. Select sound ripe fruit, crush it, and heat slowly to the simmering point—180°F. Strain through double thickness of cheesecloth, and let stand in a cool place for a few hours to settle. Pour the juice carefully from the dregs. The addition of sugar will make a finer flavor. It may be used in any desired proportion, a fair allowance being one cup of sugar to one gallon of juice. Pour the juice into hot sterilized bottles, leaving a half-inch space below the bottom of the cork. Put sterilized corks in loosely, and set the bottles on a rack in a hot-water canner, having the water come just to the top of the juice in the bottles. Sterilize at the simmering-point for thirty minutes at sea-level. (See Table II for time at higher altitudes.) Remove from canner, put stoppers in tightly, and, when cool, dip the top of the bottle in melted paraffin or sealing-wax. These home-made fruit juices are excellent for use in gelatin desserts, puddings, sauces, ice-cream, sherbet, punch, etc. They can be bottled without sugar, and later made into jelly.

VEGETABLES

POD-VEGETABLES include *string beans*, *lima beans*, *okra*, *peppers*, and *peas*. These should be canned not later than five hours after picking, and earlier if possible. They must be tender and sound. String or hull them, and wash carefully. Grade them for size, age, and tenderness. Blanch them from 5 to 10 minutes in boiling water, and cold-dip quickly. Pack closely in hot sterilized jars, being careful not to crush peas or lima beans. Leave a half-inch of space at the top of the jars of peas, because peas swell when sterilizing. Add one level teaspoon of salt to each quart of product. Fill jars with boiling water. Place rubbers and lids in position, and partially seal. Sterilize the required length of time. (See Tables I and II.) Remove from canner, complete the seal, cool, and test. Label, wrap, and store.

ROOT-VEGETABLES includes *beets*, *carrots*, *parsnips*, *salsify*, *sweet potatoes*, and *turnips*. Wash them thoroughly, using a vegetable brush. Grade them for size, color, and degree of ripeness. Leave the root and two inches of the stem on beets so that they will not fade in blanching. Cut leaves, roots, and stems from other root-vegetables. Blanch in boiling water 5 to 10 minutes or long enough to loosen the skin. Cold-dip

*Adapted from Government Bulletin 858.

quickly. Scrape to remove the skin. Pack whole, in slices or lengthwise pieces, in hot sterilized jars. Pack beets whole, if possible. Those small enough to put 40 in a quart jar are the best size to can. Add a level teaspoon of salt to each quart of product. Fill jars with boiling water. Place rubbers and lids in position, and partially seal. Sterilize for the required length of time (See Tables I and II). Remove from canner, complete the seal, cool, and test. Label, wrap, and store.

VEGETABLE GREENS. Cultivated greens include *spinach*, *kale*, *swiss chard*, *turnip and beet tops*, *French endive*, *Chinese cabbage*, *upland cress*, and *mustard*. Among the wild greens are *sour dock*, *wild mustard*, *dandelion*, *marsh marigold*, *lamb's quarter*, *watercress*, *smartweed*, and *purslane*. Sort greens very carefully, discarding all decayed or diseased leaves and any foreign weed leaves. Wash in running water if possible, removing all dirt, sand, and grit. Place in cheesecloth or strainer, and blanch 15 minutes by steaming. Cold-dip quickly. Cut ready for table use, and pack very tightly in hot sterilized jars. Add one teaspoonful of salt per quart, and fill jars with boiling water. A few strips of salt pork or some bacon fat may be added for flavor if desired. Place rubbers and tops in position, and partially seal. Sterilize for the required length of time. (See Tables I and II.) Remove from canner, tighten seal, cool, and test. Label, wrap, and store.

UNCLASSIFIED VEGETABLES. A few vegetables belong in no special class. Separate directions are given for canning each of these.

Asparagus is a very hard to keep, therefore special care must be used in canning it. It should be very tender and should be canned immediately after gathering, if possible. It should never be canned later than 5 hours after picking. Wash well, using a vegetable brush. Cut off the woody part of the stalk. Grade for age, size, and color. Cut stalks into long or short pieces of uniform length. A length that will just stand in the jar is good. Blanch from 3 to 5 minutes. It may be tied in bundles for blanching. Place the lower ends in boiling water for half the time of blanching. Then immerse the whole stalks for the remainder of the time. The tops will then retain their shape. Cold-dip quickly. Pack closely with tips up. Add one teaspoon of salt per quart, and fill the jar with boiling water. Sterilize for the required length of time. (See Tables I and II.) Remove from canner, cool, and test. Label, wrap, and store.

Cabbage. Use small solid heads. Cut into sections and remove core. Blanch from 5 to 10 minutes in boiling water. Cold dip. Pack in hot sterilized jars. Add one teaspoonful of salt per quart. Fill jar with boiling water. Adjust rubber and lid. Partially seal and sterilize the required time. (See Tables I and II.) Remove from canner, complete the seal, cool, and test. Label, wrap, and store.

Cauliflower. Place the flowered portions in cold brine ($\frac{1}{2}$ cup salt to 1 quart of water) for 1 hour. Blanch in boiling water 3 minutes. Cold-dip quickly. Pack in hot sterilized jars. Add 1 teaspoon of salt per quart. Fill jar with boiling water. Place rubbers and caps in position, and partially seal. Sterilize the required length of time. (See Tables I and II.) Remove from canner, complete the seal, cool, and test. Label, wrap, and store.

Corn should be canned as quickly as possible after it is gathered. It should never stand more than 5 hours. It should be canned when it is

between the milk and dough stage. Prepare it by removing the husks and silks. Blanch, on the cob, in boiling water from 5 to 10 minutes. Cold-dip quickly. If to be canned on the cob, use large jars, packing the ears closely. If not, cut it off the cob with a thin sharp knife, and pack in hot sterilized jars to within one-half inch of the top. Add a teaspoon of salt per quart, and fill the jars with boiling water. Adjust rubbers and tops, and partially seal. Sterilize the required length of time. (See Tables I and II.) Remove from canner, complete seal, cool, and test. Label, wrap, and store.

Egg-Plant. Pare the egg-plant or leave the skin on, as desired. Cut into slices, and blanch 5 to 10 minutes. Cold-dip quickly. Fill the jars with boiling water. Do not add salt, as it causes the egg-plant to turn dark. Adjust tops, and partially seal. Sterilize for the required length of time. (See Tables I and II.) Remove from canner, complete the seal, cool, and test. Label, wrap, and store.

Pumpkin or Squash. Method I. Remove skin and seeds. Cut into cubes. Blanch in boiling water 3 minutes, and then cold-dip it. Pack closely in hot sterilized jars. Add one teaspoon of salt per quart, and fill with boiling water. Adjust rubbers and lids, and partially seal. Sterilize the required length of time. (See Tables I and II.) Remove from canner, complete the seal, cool, and test. Label, wrap, and store.

Method II. Cut into sections. Remove skin and seeds. Cook for 30 minutes to reduce to a pulp. Pack closely in hot sterilized jars. Add one teaspoon of salt to each quart, but add no water. Adjust rubber and lid, and partially seal. Sterilize the required length of time. (See Tables I and II.) Remove from canner, complete the seal, cool, and test. Label, wrap, and store.

Tomatoes. Select firm ripe tomatoes, grade them for size, color, and ripeness. Scald $1\frac{1}{2}$ minutes to loosen skins. Cold-dip quickly. Remove stems, core, and skins. Pack whole or in quarters as closely as possible without crushing. Add one teaspoon of salt per quart. Since so much of the tomato is water it is not necessary to add water. If liquid is needed, add hot strained tomato juice. Usually if the tomatoes are pressed down closely together additional liquid will not be necessary. Adjust rubbers and tops, and partially seal. Sterilize the required length of time. (See Tables I and II.) Remove from canner, complete the seal, cool, and test. Label, wrap, and store.

MEATS

UNCOOKED MEATS. *Poultry, game, and fish.* Kill and draw at once. Wash carefully, and cool until the animal heat has left the meat. Cut into convenient sections, and pack at once in hot sterilized jars. Add one teaspoon of salt per quart, and fill jar with boiling water. Adjust rubbers and lids, and partially seal. Sterilize the required length of time. (See Tables I and II.) Remove from canner, complete the seal, cool, and test. Label, wrap, and store.

PARTIALLY COOKED MEATS. *Poultry, game, beef, pork, lamb, and fish.* Prepare by baking, boiling, frying, or roasting without using flour in any way, as it prevents the heat from penetrating the flesh and thus makes the meat hard to sterilize. Season as for use, and cook three-fourths done. Pack closely in hot sterilized jars, and add the gravy or liquid in which it has been cooking. It is not necessary for the jar to

be full of liquid. Adjust rubbers and tops, and partially seal. Sterilize the required length of time. (See Tables I and II.) Remove from canner, complete the seal, cool, and test. Label, wrap, and store.

Method for Packing Chicken. Use a quart jar. Do not pack the giblets with the meat. Pack the saddle with a thigh inside. Pack the breastbone with a thigh inside. Pack the backbone and ribs with a leg inside. Pack a leg, large end down, at the side of the breastbone. Pack the wings, wishbone, and neck.

SOUPS

Attractive and economical vegetable mixtures may be canned for use in soup. Small quantities left from packing different vegetables may be used. Any desired combinations may be made, such as carrots, peas, beans, and onions, or tomatoes, peppers, celery, and onions. The vegetables should be prepared separately as for canning, and packed in layers in the jars or mixed together before packing. Salt and hot water should be added as for any simple vegetable, or stock may be used instead of hot water. Consult tables for the length of time to sterilize.

TROUBLES IN CANNING

LOSS OF LIQUID FROM THE JARS. Liquid may be lost from the jars during sterilization if the water in the canner does not cover the tops of the jars, if the lids of the jars are adjusted too loosely, or if there is not a free circulation of water under the jars. Beans, peas, and corn contain air in their tissues, and, when the air is driven off by heat, the boiling water rushes in to take its place, leaving space in the jar which is not filled with liquid. Liquid will be lost from jars of product sterilized in the pressure cooker if the pressure is allowed to go up and down or if the petcock is opened before the pressure goes to zero. Products will keep just as well if the jar is not full of liquid, but, of course, they do not look so nice.

AIR BUBBLES IN THE JAR may be removed before putting it into the canner, by the use of a knife or a long paddle mentioned above as being convenient for placing the products in the jar. Air bubbles will, however, not prevent the product from keeping, because during the long process of cooking, the air in the jar is sterilized as well as the other contents.

MOLD may develop on canned goods if the seal is defective; if, after sterilizing, the top is removed from the jar to replace a bad rubber ring and the jar of product is not resterilized for a short time; or if the jar is kept in a damp place.

SHRINKAGE DURING STERILIZATION. Products may shrink during sterilization if they are not properly blanched and cold-dipped; if they are not packed carefully and closely; or if they are sterilized for too long a time.

PRESERVING

In making preserves a large amount of sugar is combined with fruit, the heavy syrup thus formed acting as a preservative. When properly made, the fruit in the preserve keeps its form, is plump, tender, clear, and of good color. The syrup should be clear also.

GENERAL METHOD. Prepare the fruit as for canning. Cook hard fruits, such as pears and quinces, in boiling water until partially

tender. The general proportions of fruit, sugar, and water for preserving are 1 part fruit to $\frac{3}{4}$ to 1 part sugar, and $\frac{1}{2}$ to $\frac{1}{2}$ part water by weight. Make a syrup by boiling the sugar and water 5 minutes. Cool the syrup before adding the fruit, to prevent its shriveling and toughening. Add the small fruit or the partially cooked large fruit, a little at a time, and cook slowly until it is tender and clear. Cool. Pour into hot sterilized glasses or jars. Cover with melted paraffin, or seal.

STRAWBERRY PRESERVES.* Select ripe, firm, fresh berries. Wash them in a strainer and stem them. Weigh them, and place an equal weight of sugar in a preserving kettle. Add just enough water to dissolve the sugar and boil 5 minutes. Cool, add the berries, and cook them slowly until tender. Remove the kettle from the fire and let the contents cool partially. Place in hot sterilized glasses or jars, and cover with paraffin, or seal. The best results will be obtained if only a small quantity of fruit is cooked at one time. Plums or other berries may be preserved in the same way.

CHERRY PRESERVES. Proceed as with berry preserves, except pit the cherries, and use only three-fourths as much sugar as fruit.

WATERMELON PRESERVES. Use the part of the watermelon between the outside, tough, green rind and the ripe edible portion. Cut into cubes and let it stand over night in salt water (4 tablespoons of salt to 1 quart of water). Drain, and place in clear, cold water for an hour. Drain and cook until tender, using water enough to cover. Make a syrup using 1 pound of sugar for each pound of rind and water enough to dissolve the sugar. Cook in it half a sliced lemon for each pound of rind. Cool. Add the rind, and cook until the watermelon is clear and the syrup is thick. Cool. Pour into hot sterilized jars, and seal.

FIG PRESERVES.† For 6 quarts of figs use 2 quarts of sugar and 3 quarts of water. Put the figs into a boiling soda solution (1 cup of soda to 6 quarts of boiling water) and allow them to remain about 15 minutes. Rinse twice in cold water. Drain thoroughly. Make a syrup by boiling the sugar and water 10 minutes. Cook the figs rapidly in this syrup until they are clear and tender. Remove the figs, and let them cool. Boil the syrup until quite thick and pour it over the figs. Cool partially, and pack in hot sterilized jars. Seal tight.

SUN PRESERVES. Strawberry.‡ Select ripe firm berries. Pick and preserve them the same day. Stem and wash them. Place them in a shallow platter in a single layer. Sprinkle sugar over them, and pour over them a syrup made by boiling 4 cups of sugar with $1\frac{1}{2}$ cups of water until thick. Cover with a glass dish or a plain window-glass. Let them stand in the sun 8 to 12 hours. Pack in glasses or jars and cover with melted paraffin. Keep in a cool dry place.

JAMS, CONSERVES AND MARMALADES

Jams are made of small fruits which are not whole or firm enough for preserving. In jams the fruit does not remain whole, but forms a mixture which is alike throughout.

Conserves are made of large or small fruits cooked in the same manner as jams. Sometimes nuts are added.

*Adapted from Ohio Bulletin, Vol. IV, No. 36. Jelly-Making; Preserving.

†Adapted from Government Bulletin 853.

‡Adapted from Government Bulletin 839.

Marmalades are jelly-like in texture with slices of fruit appearing throughout the mixture.

BERRY JAM.* Half the quantity of berries used for jam should be ripe and the other half a little underripe. The ripe fruit gives a fine flavor and color, and the underripe fruit gives a jelly-like consistency to the jam. Weigh the berries and allow three-fourths of a pound of sugar to each pound of fruit. Crush the fruit, heat it through, and cook until a good jelly test can be obtained—that is, a small amount being slightly cooled falls in a sheet or flake from the side of a spoon. (See under *Jelly-Making*.) Pack in hot sterilized glasses or jars. Cover with melted paraffin, or seal.

PEACH JAM.* Cook the following ingredients together until the mixture jells. (See *Jelly-Making*.) Pack in hot sterilized jars, and seal:

2½ pounds peaches pared and	½ cup peach juice.
1 pound sugar. [cut into small pieces.	½ teaspoon whole cloves.
6 whole allspice.	½ teaspoon cinnamon bark.
1 cracked peach seed.	1 sprig mace.
1 inch ginger root. (Tie spices in a cheesecloth bag)	

GRAPE JAM.* Select grapes, half the quantity being ripe and the other half a little underripe. Wash, stem, and separate the pulp from the skins. Cook the pulp 10 minutes and pass through a sieve to remove the seeds. Add three-fourths of a cup of water to each quart of skins, and cook until tender. Put the pulp and skins together, and measure. For every quart of the mixture use one pound of sugar. Bring the fruit to a boil, add the sugar and cook, stirring frequently, until the mixture jells. (See *Jelly-Making*.) Pack in hot sterilized jars, and seal.

FIG JAM.* Select very ripe figs, and remove the stems. Treat figs with scalding soda solution, and rinse thoroughly. (See under *Fig Preserves*.) Cook in quantities not larger than 3 pounds at a time. Allow ½ pound of sugar to every 3 pounds of figs. Add barely enough water to start the cooking (½ cup). Crush the figs, heat to the boiling-point, and add the sugar. Cook until of the consistency of berry jam. Pack in hot sterilized jars, and seal.

RHUBARB CONSERVE I.† Wash and cut the stalks of rhubarb into one-inch lengths. To each cup of rhubarb add ¾ cup of sugar. Cook quickly until of the consistency of jam, stirring constantly. Add ¼ cup of chopped nut-meats (such as English or black walnuts, hickory, pecan, or butternuts) to each cup of conserve. Pour into hot sterilized glasses, and cover with melted paraffin. To prevent scorching the conserve, it may be necessary to start the cooking over an asbestos mat. The conserve thickens on cooling, therefore it is best to test its consistency by removing a small portion to a saucer and letting it cool.

RHUBARB CONSERVE II. Use 4 lbs. rhubarb, ½ lb. figs, ½ lb. preserved ginger, 2½ lbs. sugar. Chop rhubarb, figs, and ginger together until quite fine. Add the sugar and set away for 24 hours. Drain off the syrup and boil it 15 minutes. Pack the mixture in hot sterilized jars, and fill to overflowing with the syrup. When cool, cover with melted paraffin.

*Adapted from Government Bulletin 853.

†Adapted from Ohio Bulletin, Vol. IV, No. 36. *Jelly-Making; Preserving.*

PLUM CONSERVE.* Use 4 lbs. plums, 3 lbs. sugar, 1 lb. shelled nuts, 2 oranges, and 1 lb. raisins. Remove the seeds, and chop the plums. Peel the oranges, and slice thin one-half of the peel. Discard the other peel and the seeds. Mix chopped plums, orange pulp, sliced peel, sugar, and raisins. Cook rapidly until bright and thick as jam. Add the nuts just before removing from the fire. Pack in hot sterilized glasses or jars, and seal.

GRAPE CONSERVE. Use 4 lbs. grapes, 3 lbs. sugar, 1 lb. shelled nuts, 1 lemon, 1 lb. raisins. Separate the pulp from the skins of the grapes, and remove the seeds from the pulp as in making grape jam. Slice one-half of the lemon peel, and discard the rest. Cook together, until thick as jam, the grape pulp and skins, the sugar, lemon juice, sliced peel, and raisins. Add the nuts just before removing from the fire. Pack in hot sterilized glasses or jars, and seal.

ORANGE OR GRAPE-FRUIT MARMALADE.* Wash the fruit and remove the peel. Discard one-fourth of the peel. Weigh the pulp and the remaining peel. Place the peel in water, boil for 5 minutes, and pour off the water. Again cover peel with water and let simmer until tender. Pour off the water and place the peel in cold water to harden. Then cut it into as thin slices as possible. Cut the fruit into small pieces, add twice as much water, place in a kettle, and boil until the pulp is thoroughly broken up. Strain through a cheesecloth bag. To each pound of this juice and the peel add $1\frac{1}{2}$ pounds of sugar. Cook until it jells. (See *Jelly-Making*.)

CITRUS - FRUIT MARMALADE.* Use 1 grape-fruit, 1 lemon, and 1 orange. Wash the fruit and cut it very thin through pulp and rind, discarding the seeds. Weigh the fruit, and add 3 pounds of water to each pound of fruit. Let stand over night. The next day boil it for 30 minutes and then let stand 24 hours. The next day measure or weigh the fruit, and for each pound or portion of fruit add 1 pound or portion of sugar. Cook until it jells, stirring it to keep from burning. Pour into hot sterilized glasses or jars, and when cool cover with melted paraffin.

GINGERED PEARS.* Use pears not quite ripe. Peel, core, and cut them into thin slices. To 8 pounds of pears add 6 pounds of sugar, 1 cup of water, the juice of 4 lemons, the rind of the 4 lemons cut into thin strips, and $\frac{1}{2}$ pound of ginger-root cut into pieces. Simmer until thick as marmalade. Pack in hot glasses or jars, and seal.

JELLY-MAKING

In making jelly the juice of fruit is extracted, usually by boiling the fruit in water, and then cooked with sugar until it reaches the jelly stage.

CHARACTERISTICS OF GOOD JELLY. A good jelly should be bright, clear, and sparkling. It should be tender enough to quiver without breaking. It should cut easily with a distinct cleavage retaining clear distinct angles and surface.

FRUITS SUITABLE FOR JELLY-MAKING. The best fruits for jelly-making contain both *pectin* and *acid*. Pectin causes the juice to jell, and acid is necessary to make the jelly firm. Fruits rich in both pectin

*Adapted from Government Bulletin 853.

and acid are: green or partly ripened Concord grapes, sour apples, crab-apples, oranges, kumquats, currants, plums, huckleberries, blackberries, and raspberries. Strawberries and cherries contain acid, but are lacking in pectin. Peaches, pears, sweet apples, guava, and quinces contain pectin, but lack acid. If, however, the missing property be added to any fruit of the last two groups named, jelly can be made of this fruit. Jelly can be made by combining a fruit containing acid with one containing pectin. Pectin is found in larger quantities in fruit that is a little underripe and in fruit that has been cooked. Therefore, very ripe fruit should not be used for jelly-making, and fruit should be cooked before extracting the juice for jelly-making.

EXTRACTING THE JUICE. *First Extraction.* Very juicy fruits as currants, raspberries, and grapes should be stemmed, washed, and cooked in the top of a double boiler, adding no water; or they may be cooked in an enameled preserving kettle with just enough water to keep them from burning (1 cup water to 4 or 5 quarts of fruit). Cover the kettle, and place it where the fruit will cook slowly, stirring it occasionally with a wooden spoon. When hot through, crush the fruit with a well-soaked wooden masher. Continue cooking until the whole mass is cooked through. Then pour it into a double-cheesecloth jelly bag which has just been wrung out of hot water. Let the juice drain into an earthenware or enameled bowl. The bag must not be squeezed, as some of the pulp may be forced through and the jelly made cloudy. Wash less juicy fruits, such as apples and quinces. Cut them into small pieces without paring and discard all unsound parts. Place the fruit, seeds, skins, and cores in the preserving kettle, cover with water, and cook until tender. Mash and drain as for juicy fruits. Make more than one extraction if possible.

Second and Later Extractions. When the first extraction is well drained out, generally within an hour, transfer the pulp to the preserving kettle, cover it with water, stir well, and cover the kettle. Bring slowly to the boiling-point and simmer it for 15 or 20 minutes. Strain it through jelly bag as for the first extraction. If the pectin test indicates much pectin, make a third extraction. Usually only three extractions can be made, but some fruits allow five. Second and later extractions may be combined.

Test for Pectin. To 1 tablespoon of the fruit juice add 1 tablespoon of 95% alcohol. Mix thoroughly and let it stand. If pectin is present, a gelatin-like mass will form which can be gathered on a spoon. If a large quantity of pectin is present, it will slip from the juice in one mass or clot. This indicates that equal quantities of sugar and juice may be used in making the jelly. If the mass is divided, three-fourths as much sugar as juice should be used. If the pectin is thin and much divided, only one-half as much sugar as juice should be used.

PROPORTION OF SUGAR TO JUICE. (See under test for pectin.) For currants and partly ripened grapes, the correct proportion for the first extraction is usually as much sugar as juice. For red raspberries and for fruits to which much water is added, such as sour apples, crab-apples and cranberries, the correct proportion for the first extraction is three-fourths as much sugar as juice. However, it is best to make the pectin test to determine the amount of sugar to use.

If too little sugar in proportion to the pectin is used, the jelly will

be tough. If too much sugar is used, the jelly will be too soft to hold its shape. If too much sugar has been used, add more juice, thus supplying more pectin.

The second and third extractions of juice should be mixed and boiled down until the pectin test is the same as for the first extraction. Sugar may then be added as for the first extraction.

COOKING THE JELLY. *The Amount of Juice to Cook at One Time* will depend on the size of the kettle to be used and the method of heating. The kettle should hold about four times the quantity of juice that is to be cooked in it. The heat should be sufficient to boil the juice rapidly, for long cooking destroys the pectin, making the jelly dark.

The Time Required for Boiling Jelly depends upon the proportion of sugar to juice, the proportion of pectin in the juice and possibly the proportion of acid in the juice. From 8 to 10 minutes may be sufficient time for boiling currant and grape juice, while from 20 to 30 minutes may be required for raspberry, blackberry, or apple juice.

Adding the Sugar. The sugar should be added to the juice when the period of boiling is about half completed. (For amount to use see above.) If the sugar is heated before adding it, the cooking process is hastened. Care should be taken not to scorch the sugar while heating it.

The Jelly Test is made by allowing the juice to drop from the side of a hot spoon held just above the surface of the jelly. When two drops form and drop together the jelly is done. Another test is to allow the juice to drop from a spoon held high above the kettle. If it sheets or flakes from the spoon, the jelly is done. The old test of placing jelly in a dish to cool often allows the mass in the kettle to cook too much while the small amount is cooling.

Method. Measure the juice to be used, place it in the preserving kettle, and bring it quickly to the boiling-point. Boil rapidly for about half the time required, skim it, and add the hot sugar. Stir until the sugar is dissolved and at intervals afterward to keep it from burning. Boil rapidly until a satisfactory jelly test is secured.

TREATMENT AFTER COOKING. Remove any scum from the jelly, pour it at once into hot sterilized glasses, and set it aside to cool. It should cool quickly. When cool, cover with melted paraffin. If a pointed instrument is run around the edge of the glass while the paraffin is hot, a better seal can be obtained. Cover with paper or a tin cover. Store in a dry, cool, dark place.

MISTAKES TO AVOID IN JELLY-MAKING. *Soft Jelly* will result if too much sugar is used or if boiling is not continued long enough after the addition of the sugar to drive off excessive water.

Tough Jelly will result if too little sugar is used or if the boiling is continued after the jellifying-point is reached.

Crystals in Jelly result if too much sugar is used, if the juice is boiled too long before the sugar is added, or if crystals which may have formed on the side of the kettle fall into the glasses of jelly.

Cloudy Jelly may result if the fruit is cooked too long before straining off the juice or if sufficient care is not used in straining the juice.

APPLE JELLY.* Use 1 lb. fruit and 2 lbs. water. Wash the fruit and

*Adapted from Ohio Bulletin, Vol. IV, No. 86. Jelly-Making; Preserving.

cut it in pieces, removing any unsound parts. Boil 30 to 45 minutes, and strain. Determine the amount of sugar to use by making the pectin test. Boil the juice 10 minutes, skim, add the sugar, and cook until the jelly-point is reached. Remove from the fire, skim, and pour into hot sterilized glasses. When cool, cover with melted paraffin.

GRAPE JELLY.* Use 4 lbs. of grapes and 1 lb. of water. Crush the fruit and cook in the water 20 minutes and strain. Make the pectin test to determine the amount of sugar needed. Boil the juice 5 minutes, skim, add the sugar, and cook until the jelly-point is reached. Remove from the fire, and skim. Pour into hot sterilized glasses, and when cool cover with melted paraffin.

BLACKBERRY JELLY.* Use 4 pounds of blackberries and 1 pound of water. Select 3 pounds of ripe fruit and 1 pound of underripe fruit. Wash, stem, and boil in the water 15 minutes. Crush and strain. Make the pectin test to determine the amount of sugar required. Boil the juice 10 minutes, skim, and add the sugar. Continue boiling until the jelly-point is reached. Remove from the fire, and skim. Pour into hot sterilized glasses. Cool, and pour melted paraffin over it.

*Adapted from Government Bulletin 858.

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Douglas County Canning Team, 1918



STATE OF NEVADA
NEVADA INDUSTRIAL COMMISSION

**Statement of Earned Premium and Refund by Contributors for
the first five years' operation of the State Insurance Fund,
July 1, 1913, to June 30, 1918, inclusive.**

CARSON CITY, July 1, 1919.

To Contributors to the State Insurance Fund:

In conformity with the provisions of subdivision "c" of section 21 of the Nevada Industrial Insurance Act, as amended to take effect July 1, 1919, and resolution of the Nevada Industrial Commission of June 23, 1919, a refund of the surplus of assets over liabilities of the State Insurance Fund has been declared proportionate to the loss experience of the various classifications of industry and to the contributions of the individual members of such classes as shown herein.

Credit for individual premium payments and consequent refund allowances has been given to the original contributors as they appear upon our records and summarized herein. No effort has been made to determine the respective rights of an assignee and the original contributor where transfers of title have been noted.

Please compare carefully the amount credited to your account in this statement with your records, noting particularly that contributions are shown separately for each classification of industry, and immediately notify the Commission of any discrepancy found. Where the operations of a contributor fall into more than one classification a certain portion of the total premium paid will be found credited under each classification. All remittances received in payment of premiums for operations conducted from July 1, 1913, to June 30, 1918, are included in this pamphlet. Your cooperation in verifying these items of income, and in commenting upon any feature of the application or administration of the Nevada Industrial Insurance Act, will be duly appreciated by the

NEVADA INDUSTRIAL COMMISSION.

EXPERIENCE OF STATE INSURANCE FUND, FIVE YEARS' OPERATIONS—JULY 1, 1913, TO JUNE 30, 1918 Revised Statement as of July 1, 1919

Industry	Total earned premiums collected	Comp. paid, awarded, and estimated due	Administra- tion expense	Reserve for catastrophe	Total charges	Net surplus or deficit	Percentage of contri- butions refunden
1. Mining.....	\$223,510.16	\$722,492.44	\$33,151.68	\$49,431.15	\$865,075.27	\$58,434.89	6.327
2. Ore reduction.....	122,849.97	117,586.39	12,106.09	5,843.82	135,536.30	12,696.33	None
3. Nevada Consolidated Copper Company.....	307,292.96	227,886.79	31,022.22	16,298.32	275,207.33	32,085.63	10.441
4. Railroads.....	38,662.90	24,411.58	3,893.04	2,418.43	30,723.05	7,939.85	20.330
5. Public utilities.....	38,486.90	14,683.50	3,882.96	2,387.22	20,873.68	17,613.12	45.764
6. State, counties, cities and school districts.....	57,432.58	41,453.41	5,619.34	3,487.50	50,560.25	6,872.33	11.965
Total Classes 1 to 6, inclusive.....	\$1,468,135.37	\$1,148,484.11	\$149,625.33	\$79,866.44	\$1,377,975.88	\$122,845.82*	
7. Miscellaneous—							
Auto dealers, garages, auto stages.....	\$5,307.46	\$4,929.92	\$521.74	\$220.55	\$5,672.21	\$364.75	None
Brewing, bottling, ice manufacturing.....	3,020.72	296.95	1,064.06	201.07	1,562.07	383.22	12.686
Construction, building.....	9,845.87	7,749.89	987.89	531.67	9,249.45	1,249.07	12.686
Creameries, and dairies.....	1,257.06	6,104.36	123.58	75.90	6,303.84	5,046.76	12.686
Flour milling.....	1,467.24	644.82	143.25	66.45	854.52	184.87	None
Highway construction, paving, miscellaneous construction.....	1,586.70	527.00	155.98	95.65	778.63	201.29	12.686
Hotels, restaurants, saloons.....	9,437.09	159.00	927.70	648.43	1,736.13	1,197.20	12.686
Laundries.....	6,390.32	483.02	622.29	419.18	1,524.49	803.07	12.686
Logging and lumbering.....	82,640.97	35,532.69	3,208.72	1,575.76	40,317.07	7,676.10	12.686
Machine shops, millwrights, miscellaneous manufacturing.....	5,116.13	1,891.03	502.93	318.62	2,712.58	1,524.49	12.686
Packing-houses.....	8,944.31	13,734.35	279.26	448.28	15,061.89	6,417.58	12.686
Printing.....	2,820.01	0.00	277.22	206.94	484.16	357.75	None
Railroad construction.....	7,699.01	3,451.46	756.84	71.98	4,280.28	976.71	12.686
Sugar refining.....	8,961.46	7,781.13	34.14	391.76	8,492.70	7,504.96	12.686
Teaming and transfer.....	6,656.54	7,781.13	654.36	391.76	8,827.25	2,170.71	None
All other mercantile, warehouse, theater, office buildings, etc.....	22,250.70	4,970.67	2,187.32	1,518.75	8,676.74	2,822.76	None
Total Class 7.....	\$126,357.99	\$97,384.75	\$12,323.13	\$6,825.13	\$116,533.01	\$3,824.98*	12.686
Total all classes.....	\$1,613,493.36	\$1,245,868.86	\$161,948.46	\$86,691.57	\$1,494,508.89	\$131,670.80*	

*Italic figures denote deficit. *Deficits not included in this total.*

STATEMENT ASSETS AND LIABILITIES, JUNE 30, 1918, STATE INSURANCE FUND Revised as of July 1, 1919

Assets	Liabilities
Cash.....	Reserve for pensions allowed.....
Investments.....	Reserve for estimated liabilities.....
Premiums due.....	Reserve for catastrophe hazard.....
Accrued interest.....	Reserve for unearned premiums.....
Furniture and fixtures.....	Reserve for refund of excess contributions.....
Less depreciation.....	Unclaimed vouchers.....
Total assets.....	Total liabilities.....
\$672,111.39	\$570,592.70
\$70,562.70	
\$1,518.69	
	\$243,976.02
	174,245.80
	104,000.00
	18,938.50
	131,670.80
	1,666.58

Class 1
MINING OPERATIONS

<i>Dis. Vr. No.</i>	<i>Contributor and Address</i>	<i>Premiums</i>	<i>Refund</i>
1	Abello, Giordana & Price, Manhattan.....	\$59.34	\$3.75
2	Ackerman, Geo. B., Douglass.....	59.21	4.38
3	Adams Hill Corporation, Eureka.....	80.69	5.11
4	Adams & Miller, Hawthorne.....	784.20	49.62
5	Adaven Mining & Smelting Co., Marble.....	263.40	16.67
6	Adeline Leasing Co., Pioche.....	8.53	0.54
7	Admiral Gold Mining Co., Eldorado Canyon.....	76.84	4.86
8	Aherna, H., New York Canyon.....	7.50	0.47
9	Ajax Nevada Gold Mining Co., Carson City.....	78.20	4.95
10*	Alameda Mines Co., Luning.....	78.56	4.97
11	Alamo Mining Co., Sharp.....	71.50	4.52
12	Alberta Mine, Hawthorne.....	6.75	0.48
13	Alderson, Victor C., Golconda.....	10.27	0.65
14	Alice Copper and Zinc Co., Goodsprings.....	203.66	12.89
15	Alkali Mines Co., Eureka.....	437.11	27.66
16	Allen, W. E., Goodsprings.....	107.09	6.78
17*	Alpha Exchequer Mining Co., Virginia.....	237.47	15.03
18	Alta Mine, Round Mountain.....	37.60	2.38
19	Alumite Co. of Nevada, Sulphur.....	110.00	6.96
20	Amalgamated Pioche M. & S. Corp., Pioche.....	5,781.23	365.81
21	Amboy Mine, Manhattan.....	18.10	1.15
22	American Barium Co., Blair.....	95.37	6.03
23	American Carrara Marble Co., Carrara.....	2,113.54	133.73
24	American Exploration & Contracting Co., Battle Mountain.....	14.43	0.91
25	American Onyx Co., Manhattan.....	192.14	12.16
26	Ames & Billet Lease, Joy.....	20.25	1.28
27	Anderson, I. W., Jarbridge.....	426.47	26.98
28	Andes Silver Mining Co., Virginia.....	617.49	39.07
29	Antelope Springs Mining Co., Junco.....	15.00	0.95
30	Antimony King Mining Co., Austin.....	145.59	9.21
31	Antimony & Silver Mines Co., Galena Canyon.....	44.50	2.82
32	Antimony Syndicate, Unionville.....	319.67	20.23
33	Archer, Kimmel & Ehrman, Yerington.....	261.69	16.56
34	Arden Plaster Co., Arden.....	2,086.51	132.02
35	Argenter Rochester Mines Co., Rochester.....	77.73	4.92
36	Argus Mines Co., Taylor.....	9.85	0.62
37	Arlington Lease, Manhattan.....	115.41	7.30
38	Armstrong, Wade, Union Mines.....	146.98	9.30
39	Arrowhead Plaster Co., Moapa.....	103.71	6.56
40*	Arthur Zinc Mining Co., Ruby Valley.....	63.10	3.99
41	Associated Mines Dev. Co., Rochester.....	55.76	3.53
42	Atkins, J. C., Hilltop.....	19.97	1.26
43	Atkins, Knoll & Co., Osceola.....	619.05	39.17
44	Atlanta Con. Gold Mining Co., Atlanta.....	122.64	7.76
45	Atlanta Home Gold Mining Co., Atlanta.....	472.27	29.88
46	Atlanta Mines Co., Goldfield.....	2,974.26	188.20
47	Atlas Wonder Mining Co., Wonder.....	220.33	13.94
48	Atofia Mining Co., Elko.....	12.78	0.81
49	Aureola Mining Co., Reno.....	21.03	1.33
50	Aurora Con. Mines Co., Aurora.....	16,299.95	1,081.37
51	Aurora Mines Co., Aurora.....	342.05	21.64
52	Aurora Ore Purchasing Co., Aurora.....	376.82	23.84
53	Austin, E. A., Jarbridge.....	488.22	30.89
54	Austin-Dakota Dev. Co., Austin.....	2,865.14	181.29
55	Austin Goldfield Mining Co., Austin.....	160.41	10.15
56	Azalia Mining Co., Goodsprings.....	480.42	30.40
57	Azurite Mine & Lease, Goodsprings.....	115.13	7.28
58	Azurite Mining Co., Goodsprings.....	211.28	13.87
59	Backman, A. C., Luning.....	11.22	0.71
60	Backlin & Flynn, Rawhide.....	59.16	3.74
61	Bagg, J. S., Eureka.....	6.44	0.41
62	Barber Canyon Placer Co., Mill City.....	114.51	7.25
63	Barker, S. Lease, Goldfield.....	88.75	5.62
64	Barney & Sabola, Goldville.....	11.85	0.75
65	Battle Mountain Exploration Co., Copper Basin.....	399.82	25.30
66	Battle Mountain Mines & Dev. Co., Copper Basin.....	2,597.11	164.33
67	Bay State Nevada Gold Mining Co., Reno.....	3.77	0.24
68	Baycraft, Charles, Jumbo.....	18.62	1.18
69	B. & B. Mining & Dev. Co., Bullion.....	187.58	11.87
70	Beck, E. L., Sodaville.....	271.07	17.15
71	Beedle, F. C., Lessee, Candelaria.....	97.06	6.14
72	Belcher Silver Mining Co., Gold Hill.....	839.44	53.12
73	Belford, S. W. et al. Reno.....	38.60	2.44
74	Ben Ezra C. & G. M. & S. Co., Searchlight.....	130.29	8.24
75	Berger-Platt Lease, East Ely.....	407.35	25.77
76	Berry, C. J., Divide.....	423.40	26.79
77	Bessemer Cons. Mining Co., Brunswick Canyon.....	2.16	0.14

Forwarded.....	\$46,962.39	\$2,971.52
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*Debit balance to the account of contributor has been deducted from amount of refund shown.

Div. Vr. No.	Contributor and Address	Premiums	Refund
	Forwarded.....	\$46,962.39	\$2,971.52
78	Bettles, Gordon M., Raiston.....	15.36	0.97
79	Big Casino Mining Co., Searchlight.....	1,033.64	65.40
80*	Big Four Exploration Co., Ruby Valley.....	16.39	0.97
81	Big Four Leasing Co., Rochester.....	738.56	46.73
82	Big Four Mine, Aura.....	49.70	3.14
83	Big H Mining Co., Rochester.....	16.50	1.04
84	Big Pine Mining Co., Manhattan.....	83.66	5.29
85	Birthday Mining Co., Goodsprings.....	154.08	9.75
86	Black-Eagle Gold Mining Co., Rawhide.....	475.54	30.09
87	Black Forrest M. & S. Co., Wells.....	343.76	21.75
88	Black Metals Mines, Inc., Pioche.....	86.07	2.28
89	Blackburn, W. S., Battle Mountain.....	101.59	6.43
90	Blair & Mills, Goodsprings.....	3.06	0.19
91	Blake & Dodge Lease, Goldfield.....	18.75	1.19
92	Blue Bell Mine Lease, Jackrabbit.....	15.53	0.98
93	Blue Dick Mining Co., Hilltop.....	124.68	7.89
94	Bluestone Mining & Smelting Co., Mason.....	7,256.56	459.16
95	Bluster Consolidated Mines Co., Jarbridge.....	1,366.95	86.49
96	Bonanza King Tungsten Co., Fanning.....	21.60	1.37
97	Booth & Castler, Searchlight.....	24.75	1.57
98	Boss Gold Mining Co., Goodsprings.....	1,283.79	81.23
99	Boston Ely Mining Co., Kimberly.....	368.39	22.99
100	Bowen & Holmquist, Ely.....	444.54	28.13
101	Bozich, Nick, Manhattan.....	16.45	1.04
102	Brady, S. H. & Co., Jefferson Canyon.....	1,168.15	78.91
103	Brandis, Harry, Rochester.....	41.84	2.65
104	Bray, Joseph, Austin.....	71.99	4.56
105	Brook & Meagel, Reveille.....	71.64	4.53
106	Brodine, August, Palisade.....	315.20	19.94
107	Broken Hills Mine, Fallon.....	49.02	3.10
108	Brougher Divide Mining Co., Gold Mountain.....	209.82	13.28
109	Brown Mining & Milling Co., Manhattan.....	50.11	3.17
110	Brown & Richardson, Osceola.....	5.10	0.32
111	Bruner & Sooy, Bruner.....	6.22	0.39
112	Buck & Charlie Leasing Co., Rochester.....	37.90	2.40
113	Buckeye Belmont Mining Co., Tonopah.....	881.74	55.79
114	Buckeye Buster Mining Co., Olinghouse.....	59.15	3.74
115	Buckeye Con. Mining Co., Silver City.....	53.34	3.38
116	Buckeye Tonopah Mining Co., Tonopah.....	6.57	0.42
117	Buckhorn Mines Co., Buckhorn.....	8,087.94	511.76
118	Buckskin Haleyon Mining Co., Buckskin Mountain.....	257.35	16.28
119	Buckskin National Gold Mining Co., National.....	664.22	42.03
120	Buell & Patterson Lease, Round Mountain.....	309.24	19.57
121	Buffalo Valley Gold Mines Co., Ankeny.....	172.29	10.90
122	Buffalo Valley Gold Mining & Leasing Co., Ankeny.....	97.65	6.18
123	Bull Moose Exploration Co., Carrara.....	401.94	25.43
124	Bullion Mining Co., Jean.....	2,032.72	128.62
125	Bull's Head Mining Co., Spruce Mountain.....	26.39	1.67
126	Burke (West End Lease), Ione.....	130.03	8.23
127	Burns & Meyers Lease, Yerington.....	94.01	5.95
128	Burt, C. I., Luning.....	66.19	4.19
129	Burt, C. I., Marble.....	66.55	4.21
130	Butte-Goldfield Reorganized Mining Co., Bonnie Claire.....	27.02	1.71
131	Butters, Chas. & Co., Ltd., Virginia.....	6.45	0.41
132	Butters, Louis R., Mason Valley Mine.....	78.68	4.98
133	Byllesby, H. M. & Co., Lovelock.....	671.88	42.51
134	Calamine King Mines Co., Corn Creek.....	112.45	7.12
135	Calavada Copper Co., Luning.....	2,144.55	135.70
136	Caledonia Silver Mining Co., Virginia.....	594.00	37.59
137	California Mine, Eureka.....	292.12	18.48
138	Campbell, A. F., Luning.....	26.14	1.65
139	Campbell & Kelly, Tonopah.....	95.14	6.02
140	Candelaria Syndicate, Candelaria.....	283.90	17.96
141	Carrara Mining & Milling Leasing Syn., Carrara.....	65.19	4.12
142	Cash Boy Con. Mining Co., Tonopah.....	634.80	40.14
143	Cat Creek Tunnel Co., Hawthorne.....	146.41	9.25
144	Catlin, Henry G., Eureka.....	539.08	34.11
145	Catlin, R. M., Elko.....	131.49	8.32
146	Catlin Shale Producing Co., Elko.....	45.63	2.89
147	Centennial Mining Co., Buckhorn.....	104.72	6.63
148	Chafey, E. S., Mina.....	4.25	0.27
149	Chaffey & Ellsworth, Sodaville.....	41.48	2.62
150	Challenge Con. Mining Co., Gold Hill.....	130.49	8.26
151	Chapman Smelting Co., Bernice.....	140.66	8.90
152	Chapman & Taylor Property, Big Wash.....	65.82	4.16
153	Charlton Con. Mining Co., Reno.....	187.79	11.88
154	Charleston Hill Mining & Dev. Co., National.....	37.95	2.40
155	Charleston Lease, Goodsprings.....	117.84	7.46
156	Cheefoo Mining Co., Humboldt.....	9.82	0.62
157	Chicago Nevada Gold Mining Co., Six Mile Canyon.....	59.48	3.76
158	Chief of the Hills Gold Mining Co., Searchlight.....	410.90	26.00
	Forwarded.....	\$33,606.23	\$5,290.12

*Debit balance to the account of contributor has been deducted from amount of refund shown.

Dir. Vr. No.	Contributor and Address	Premiums	Refund
	Forwarded.....	\$83,606.23	\$5,290.12
159	Christiansen & Dahl, Copper Canyon.....	1,126.94	71.31
160	Christie, M. E., Manhattan.....	4.20	0.27
161	Christie, M. M., Manhattan.....	21.24	1.34
162	Christmas Con. Mines Co., Goodsprings.....	491.10	31.07
163	Cinco Mining Co., Luning.....	18.38	1.16
164	Cinnabar Leasing Co., Lone.....	22.07	1.40
165	Clark Copper Co., Cuprite.....	322.54	20.41
166	Clark & Pembroke, Goodsprings.....	270.31	17.10
167	Cliff-Era Gold Mining Co., Nelson.....	5.40	0.34
168	Clover Mining Co., Warm Springs.....	284.99	18.03
169	Coalition Crown Mining Co., Rawhide.....	4.40	0.28
170	Cole-Huntington Lease, Rochester.....	23.52	1.49
171	Cole & Minier, Goodsprings.....	23.28	1.47
172	Colligan, J. C., Lease, Rochester.....	58.16	5.26
173	Colorado Nevada Mining & Milling Co., Nelson.....	1,110.16	70.25
174	Colton, Geo. R., Searchlight.....	84.20	2.16
175	Colton & Weidman, Searchlight.....	180.93	8.28
176	Colton & Weidman, Searchlight.....	16.10	1.02
177	Combined Metals Co., Pioche.....	1,107.42	70.07
178	Commercial Mines & Milling Co., Manhattan.....	560.32	35.45
179	Como Consolidated Mines Co., Como.....	858.39	54.81
180	Compton & Riddle, Copper Mountain.....	10.57	0.67
181	Comstock Leasing Co., Gold Hill.....	1,753.39	110.95
182	Comstock Mining & Milling Co., Silver City.....	282.49	17.87
183	Comstock Monte Cristo Mining Co., Virginia.....	1,182.24	73.54
184	Comstock Phoenix Mining Co., Virginia.....	1,751.67	110.84
185	Comstock Recovery Co., Brunswick Mill.....	86.43	2.31
186	Comstock Tunnel Co., Sutrø.....	452.56	28.64
187	Confidence Mining Co., Gold Hill.....	118.14	7.48
188	Congress Copper Co., Luning.....	204.19	12.92
189	Consolidated California & Nevada Co., Bristol.....	663.10	41.96
190	Consolidated Copper Mines Co., Kimberly.....	37,911.59	2,898.84
191	Consolidated Imperial Mining Co., Gold Hill.....	242.70	15.36
192	Consolidated Mining & Smelting Co., Tonopah.....	102.50	6.49
193	Consolidated Spanish Belt & Silver Mining Co., Spanish Peak.....	705.29	44.63
194	Consolidated Tungsten Mines Co., Williams Creek.....	29.75	1.88
195	Consolidated Virginia Mining Co., Virginia.....	4,294.87	271.76
196	Contact Mine, Goodsprings.....	809.96	19.61
197	Cook, W. L., Fallon.....	34.66	2.19
198	Cooper, H. M., Eureka.....	9.76	0.62
199	Copley & Baker, Mill City.....	6.58	0.42
200	Copper Canyon Mine, Battle Mountain.....	6,063.82	383.69
201	Copper King Mine, Luning.....	6.30	0.40
202	Copper Mines Co., Kimberly.....	317.76	20.11
203	Copper Peak Mining Co., Goodsprings.....	246.24	15.58
204	Copper Queen Mines Co., Copper Basin.....	205.30	12.99
205	Copper Ridge Mining Co., Luning.....	56.01	3.54
206	Cordes, A. A., Round Mountain.....	14.01	0.89
207	Cornforth & Sweet, Bellehelen.....	27.39	1.73
208	Corns, G. Mort, Copper Basin.....	4.40	0.28
209	Corona Gold Mining Co., Lopen.....	67.50	4.27
210	Cour d'Alene Jarbidge Co., Jarbidge.....	25.19	1.59
211	Cox & Pine, Silver Creek.....	31.26	1.98
212	Crescent Consolidated Mines Co., Crescent.....	94.20	5.96
213	Crow, J. F., Mizpah.....	21.20	1.34
214	Crown Point Extension Mining Co., Rochester.....	904.48	57.23
215	Crown Point Gold & Silver Mining Co., Gold Hill.....	733.47	49.57
216	Crown Queen Mining Co., Nelson.....	266.94	16.89
217	Cumberland Mine, Battle Mountain.....	25.62	1.62
218	Cuprite Sulphur Corporation, Cuprite.....	4.76	0.30
219	Cyrus Noble Lease, Searchlight.....	11.70	0.74
220	Dahl, James, Copper Canyon.....	5,371.69	339.89
221	Danley & Danley, Kinsley.....	17.70	1.12
222	Danley-Lloyd Mining Co., Carlin.....	19.35	1.22
223	Darrington, Walter, Goodsprings.....	35.48	2.24
224	Darrington, Walter (Green Monster Mine Lease), Goodsprings.....	80.00	5.06
225	Davenport Independent Leasing Co., Sodaville.....	16.80	1.06
226	Davey Lease, Goldfield.....	17.85	1.13
227	Davis, Louis L., Silver Bow.....	67.60	4.28
228	Davis, Key, & Co., Tonopah.....	3.30	0.21
229	Dawn Mining Co., Goodsprings.....	60.53	3.83
230	Day-Bristol Consolidated Mining Co., Bristol.....	526.03	33.28
231	Day-Bristol Consolidated Mining Co. (Receiver), Bristol.....	36.92	2.34
232	D. & C. Mining Co., Awakening.....	229.57	14.53
233	Defenbaugh & Gayer, National.....	31.14	1.97
234	Degenhardt & Co., Pioche.....	9.69	0.61
235	Delamar Tailings Piles, Delamar.....	12.16	0.77
236	Delaware Mining Co., Vernon.....	247.04	15.63
237	Demijohn Consolidated Mining Co., Pioche.....	574.28	36.34
238	Denver Nevada Mining Co., Battle Mountain.....	232.93	14.74
239	Desert Leasing Co., Millers.....	12.00	0.76
	Forwarded.....	\$156,987.33	\$9,933.28

*Debit balance to the account of contributor has been deducted from amount of refund shown.

Div. Vr. No.	Contributor and Address	Premiums	Refund
	Forwarded.....	\$156,987.33	\$9,933.28
240	DeWitt & Kelly, Battle Mountain.....	35.87	2.27
241	Dexheimer, Wm. Lease, Yerington.....	14.82	0.94
242	Dexter White Caps Mining Co., Manhattan.....	403.84	25.55
243	Diamond Drilling Co., Nelson.....	88.39	5.59
244	Diamond Peak Dev. Co., Union.....	94.86	6.00
245	Diamondfield Black Butte Reorg. Mining Co., Goldfield.....	212.63	13.45
246	Divide Extension Mining Co., Gold Mountain.....	143.07	9.05
247	Dolbear Mining Co., Lovelock.....	194.98	12.84
248	Dome Mining & Reduction Co., Bullion.....	406.34	25.71
249	Donnolly Mountain Mining Co., Donnolly Mt. Mine.....	221.89	14.04
250	Doris Mining & Milling Co., Pioche.....	8.04	0.51
251	Duluth Gold Mining Co., Ione.....	3.00	0.19
252	Dunfee & Hardwick, Hornsiver.....	25.00	1.58
253	Dunn, W. A., & Co., Schellbourne.....	40.15	2.54
254	Duplex Mining Co., Searchlight.....	81.26	5.14
255	Dupont Copper Mining Co., Searchlight.....	65.44	4.14
256*	Duvall, Charles F., Virginia.....	533.52	33.76
257	Eagles Nest Hailstone Mining Co., Fairview.....	103.93	6.58
258	Easter Mine, Caliente.....	61.15	3.37
259	Eastern Star Mining Co., Midas.....	362.99	22.97
260	Eastern Star Tungsten Mining Co., Lovelock.....	32.99	2.09
261	Eden, Fred, Morgan Mill.....	28.77	1.82
262	Edison, J. H., & Co. (Copper Queen Group), Battle Mountain.....	282.46	14.71
263	Edna Consolidated Mining Co., Peavine Mountain.....	41.61	2.63
264	E. & F. Mining Co., Jackrabbit.....	119.18	7.54
265	Eggar, J. A., Goodsprings.....	39.89	2.52
266	Eggler, G. W., Goodsprings.....	8.43	0.53
267	El Dorado Empire Mining Co., Nelson.....	36.40	2.30
268	El Dorado Flagstaff Mining & Milling Co., Nelson.....	102.85	6.51
269	El Dorado Gold Star Mining Co., El Dorado Canyon.....	128.32	8.12
270	Electric Mining & Reduction Co., Reno.....	36.74	2.32
271	Electro-Silicon Co., Virginia.....	53.36	3.38
272	Elko Mining Co., Jarbidge.....	1,536.15	97.20
273	Elko Prince Dev. Co., Midas.....	429.95	27.20
274	Elko Prince Leasing Co., Midas.....	3,676.91	232.66
275	Elko Prince Mining Co., Midas.....	455.81	28.84
276	Elkora Mines, Jarbidge.....	9,057.29	573.10
277	Elmore Mining Co., Jarbidge.....	4.78	0.30
278	Ely Calumet Copper Co., Ely.....	45.76	2.90
279	Ely Calumet Copper Co., Ely.....	58.11	3.36
280	Ely Consolidated Copper Co., Ely.....	388.83	24.60
281	Ely Consolidated Copper Co., Ruth.....	277.92	17.59
282	Emerick & Boggs, Searchlight.....	28.78	1.82
283	English, W. R., & Co., Goodsprings.....	55.33	3.50
284	Erickson, John A., Aurora.....	283.41	17.93
285	Erno, Frank, Jarbidge.....	19.82	1.22
286	Esmeralda Copper Co., Luning.....	178.06	11.27
287	Esmeralda Mining Co., Midas.....	123.90	7.84
288	Esmeralda Mine (Reopened), Midas.....	45.90	2.90
289	Eureka Crossus Mining Co., Prospect.....	278.56	17.63
290	Eureka Holly Mining Co., Eureka.....	640.78	40.55
291	Everett & Black, Luning.....	64.18	4.06
292	Excelsior Mountain Copper Co., Hawthorne.....	194.63	12.32
293	Exploration Co., Kinkead.....	148.71	9.41
294	Fairview Golden Boulder Mining Co., Fairview.....	919.40	58.17
295	Fairview Round Mountain Mines Co., Round Mountain.....	487.83	30.87
296	Fallon Tungsten Co., Ellsworth.....	34.08	2.16
297	Fanchini, J. B., Blair.....	50.98	3.22
298	Fanchini, J. B., Blair.....	324.76	20.55
299	Franham & Drew, Mina.....	90.87	5.75
300	Favler, F. C., Goldfield.....	39.45	2.50
301	Federal Ely Lease, Ruth.....	80.00	5.06
302*	Federal Mines Co., Fitting.....	425.04	26.89
303*	Ferber Copper Co., Ferber.....	26.41	1.67
304	Finn Mining Co., Schurz.....	135.03	8.54
305	Fisher & Jensen Lease, Mason.....	102.05	6.46
306	Flannery & Moran, Donnolly Mountain.....	70.45	4.46
307	Florence Goldfield Mining Co., Goldfield.....	2,197.32	139.07
308	Florence Goldfield Mining Co. (Receiver's Acct.), Goldfield.....	72.39	4.58
309	Forsvill Rochester Mining Co., Rochester.....	237.14	15.00
310	Four J Mines Co., Rochester.....	312.57	19.78
311	Francisco, Barney, Manhattan.....	133.05	8.42
312	Frank & Kinne, Bullion.....	4.46	0.28
313*	Frankovich, Spiro, Olinghouse.....	8.00	0.51
314	Fravel Mining & Milling Co., Reno.....	214.58	13.58
315	Fravel Paymaster Mining Co., Reno.....	675.58	42.75
316	Frederickson & Eggar, Goodsprings.....	90.92	5.75
317	French Western Exploration & Reduction Co., Goldfield.....	28.47	1.80
318	Gaines, J. F., Talapoosa.....	38.76	2.45
319	Gelder, J. E. Lease, Yerington.....	48.84	3.09
	Forwarded.....	\$185,786.39	\$11,755.53

*Debit balance to the account of contributor has been deducted from amount of refund shown.

Dir. Vr. No.	Contributor and Address	Premiums	Refund
	Forwarded.....	\$185,786.39	\$11,755.53
320	Gelder, Ross, Hart & Taubert, Yerington.....	96.67	6.12
321	Gem Mine, Winnemucca.....	19.41	1.23
322	General Mines Co., Mina (Copper Bell Lease).....	255.50	16.17
323	General Mines Co., Dean (Cumberland Mine).....	1,046.86	66.24
324	General Mines Co., Orizaba (Orizaba Mine).....	545.19	34.50
325	Gilmer, C. V., Shellbourne.....	40.25	2.56
326	Giroux Consolidated Mines Co., Kimberly.....	4,132.31	261.47
327	Glasgow & Western Exp. Co., Ltd., Copper Canyon.....	186.13	11.78
328	Glendale Mining & Milling & Power Co., Cherry Creek.....	175.46	11.10
329	Goff Bros., Battle Mountain.....	82.11	5.20
330	Golconda Gold Ledge Mining Co., Golconda.....	292.71	18.52
331	Golconda Nevada Mining Co., Golconda.....	46.25	2.98
332	Goldbanks Merger Mines Co., Goldbanks.....	33.66	2.13
333	Goldbanks Quicksilver Co., Goldbanks.....	1,609.88	101.86
334	Gold Chief Mining Co., Caliente.....	107.17	-6.78
335	Gold Circle Queen Mining Co., Midas.....	39.23	2.48
336	Gold Crater Leasing Co., Manhattan.....	12.71	0.80
337	Goldfield Blue Bell Mining Co., Golden Arrow District.....	18.00	1.14
338	Goldfield Commonwealth Mining Co., Goldfield.....	31.02	1.96
339	Goldfield Consolidated Mines Co., Goldfield.....	92,691.44	5,865.02
340	Goldfield Consolidated Mines Co. (Nevada Hills Acct.), Fairview.....	60.21	3.81
341	Goldfield Great Bend Mining Co., Diamondfield.....	1,730.11	109.47
342	Goldfield Merger Mines Co., Goldfield.....	2,368.47	149.86
343	Goldfield Mines Opr. Co., Goldfield.....	54.00	3.42
344	Goldfield Oro Mining Co., Goldfield.....	1,189.63	75.27
345	Goldfield Shale Mining Co., Goldfield.....	34.87	2.21
346	Goldfield Simerone Mining Co., Goldfield.....	218.02	13.80
347	Gold Hill Nevada Gold Mg. Co., Lone Mountain.....	218.02	13.80
348	Gold Prince Mg. & Leasing Co., Gold Crater.....	56.49	3.57
349	Gold Ridge Mining Co., Schurz.....	8.96	0.57
350	Gold Zone Divide Mining Co., Gold Mountain.....	119.14	7.54
351	Golden Arrow Dev. Co., Tonopah.....	321.43	20.34
352	Golden Fleece Mining Co., Schurz.....	4.60	0.29
353	Goodale, David (Silver Dyke Mine), Sodaville.....	4,872.61	308.31
354	Goodale, David (Borax Mill), Sodaville.....	72.68	4.60
355	Goodman, Henry J., McGill.....	27.57	1.74
356	Goodsprings Anchor Co., Jean.....	3,248.06	205.52
357	Goodsprings Bill Nye Mg. Co., Goodsprings.....	348.79	22.07
358	Goodsprings Dividend Mg. Co., Goodsprings.....	149.92	9.49
359	Goodsprings Mining Co., Goodsprings.....	234.16	14.82
360	Goodsprings Pilgrim Mg. Co., Goodsprings.....	170.91	10.81
361	Gouge Eye Lease, Battle Mountain.....	80.21	1.91
362	Grace Darling Mine, Lucky Boy.....	113.14	7.16
363	Grandma Cons. Mines Co., Goldfield.....	448.45	28.38
364	Granite Hill Mine, Reno.....	135.57	8.59
365	Grant Lease, Bullion.....	456.22	28.87
366	Gray Eagle Group, Lee Canyon.....	564.61	35.73
367	Gray Eagle Mining Co., Lee Canyon.....	86.47	5.47
368	Great Eastern Lease, Pioche.....	8.65	0.55
369	Great Gulch Mg. Co., Blair.....	11.19	0.71
370	Great Western Cons. Mg. Co., Tonopah.....	1,257.27	79.55
371	Green Monster Mine, Goodsprings.....	1,343.05	84.98
372	Greenbaum, Louis, Jarbidge.....	295.20	18.63
373	Greenwood Leasing Co., Pioche.....	13.88	0.88
374	Griffith, James E., Searchlight.....	0.55	0.03
375	Groom Mine, Indian Springs.....	382.26	55.82
376	Groom South End Mg. Co., Groom Camp.....	13.16	0.83
377	Hackley & Boughton, Rochester.....	36.81	2.33
378	Hagen Property, Rochester (R. G. Gillispie Lease).....	125.15	7.92
379	Hagrott, Ernest A., Jarbidge.....	50.79	3.21
380	Hahnwald, Paul, Gold Hill.....	368.22	22.98
381	Hale & Norcross Mg. Co., Virginia.....	117.89	7.46
382	Half Moon Lease, Pioche.....	22.08	1.40
383	Halifax Tonopah Mg. Co., Tonopah.....	7,054.98	448.30
384	Hamburg Mines Co., Pioche.....	710.09	44.93
385	Hamilton & Pollard, Silver City.....	301.38	19.07
386	Hamilton Power Mg. & Trans. Co., Hamilton.....	277.46	17.56
387	Hanford, Albert, Jarbidge.....	981.55	62.11
388	Harrison, A. D., Lexington Creek.....	49.25	3.12
389	Haskell, A. S., Tonopah.....	4.20	0.27
390	Hassell, Capt. J. A., Junco.....	285.83	18.09
391	Hatch Mg. Co., National.....	237.55	15.03
392	Hatch, N. P. R. (Trustee), National.....	17.12	1.08
393	Hattie Mg. Co., Duck Creek District.....	31.17	1.97
394	Haystacks Mines Co., Haystack.....	12.24	0.77
395	Hebbard, F. A., Ramsey.....	2.10	0.13
396	Helen Betty Mines Co., Seven Troughs.....	165.68	10.48
397	Helen M. Mg. & Millg. Co., Palisade.....	70.05	4.43
398	Henderson, Robt. B., Gerlach.....	54.00	3.42
399	Herman, Adolph, Goodsprings.....	54.60	3.45
400	H. & H. Mg. Co., Millett.....	62.18	3.93
	Forwarded.....	\$319,534.24	\$20,218.40

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Div.Vr. No.	Contributor and Address	Premiums	Refund
	Forwarded.....	\$319,534.24	\$20,218.40
401	Higginbotham & Threlfall, Candelaria.....	48.03	3.04
402	Highland Mary National Mg. Co., National.....	3.40	0.22
403	Hillsdale Leasing Co., Bristol.....	394.36	24.95
404	Hobbins Lease, Manhattan.....	95.67	6.05
405	Hodgins & Drysdale Lease, Virginia.....	2.55	0.16
406	Holden M. & M. Co., Tuscarora.....	425.98	26.95
407	Holden Smelt & Mlg. Co., Tuscarora.....	10.89	0.66
408	Holmes, Thomas, Searchlight.....	32.38	2.05
409	Holmquist, Mrs. D. B., Ely.....	15.00	0.95
410	Hoosier Del Monte Mg. Co., Goodsprings.....	204.05	12.91
411	Hoosier Mines, Goodsprings.....	21.81	1.38
412	Hoosier Mining Co., Manhattan.....	89.30	5.65
413	Hope Con. Mg. Co., Eureka.....	41.02	2.60
414	Hornsilver King Mines Co., Hornsilver.....	5.11	0.32
415	Hornsilver Mining Co., Hornsilver.....	167.87	10.62
416	Hotaling Estate Co., Dayton.....	392.19	24.82
417	House & Mallory, Hawthorne.....	3.60	0.23
418	Howard Mines Co., Goodsprings.....	41.98	2.66
419	Hull, Wm. H., Pioche.....	10.09	0.64
420	Humboldt Con. Mining Co., Golconda.....	11.70	0.74
421	Humboldt Co. Tungsten M. & M. Co., Tulon.....	1,491.50	94.37
422	Hunter & Tursick, Goodsprings.....	45.39	2.87
423	Huntington, J. G., Rochester.....	44.56	2.82
424	Ida Bell Mg. Co., Terrel.....	8.50	0.54
425	Idaho-Nevada Placer Co., Copper Basin.....	7.55	0.48
426	Ideal Mine, Mina.....	3.13	0.20
427	Illinois Mining & Milling Co., Olinghouse.....	4.84	0.31
428*	Imlay Mining Co., Imlay.....	68.17	4.00
429	Independent Tungsten Co., Ely.....	234.04	14.81
430	Indiana Pioneer Mg. Co., Pioneer.....	20.40	1.29
431	Ingomar Mine, Goodsprings.....	1,401.73	88.69
432	Interstate Con. Mines Co., Goldfield.....	24.08	1.52
433	Iron Hat Mining Co., Stone House.....	179.82	11.38
434	Iron Point Placer Co., Iron Point.....	25.20	1.59
435	Iron Side Mine, Platina.....	99.09	6.27
436	Iron Side Mg. Co., Platina.....	160.14	10.13
437	Iroquois Copper Co., Luning.....	12.07	0.76
438	Ivanhoe Cinnabar Co., Ivanhoe.....	178.34	10.97
439	Jacket Crown Pt. & Belcher Mines Co., Gold Hill.....	2,895.60	183.22
440	Jarbridge Buhl Mg. Co., Jarbridge.....	14.63	0.98
441	Jarman, H. J., Goodsprings.....	4.99	0.32
442	J. B. L. Lease, Virginia.....	51.95	3.29
443	Jim Butler Tonopah Mg. Co., Tonopah.....	16,992.12	1,075.17
444	Johnnie M. & M. Co., Johnnie.....	868.19	54.98
445	Jolly Jane Leasing Co., Pioneer.....	66.48	4.21
446	Jones & Weidman, Searchlight.....	67.81	4.26
447	Jumbo Ext. Mg. Co., Goldfield.....	8,144.20	515.32
448	Jumbo Ext. Mg. Co., Rand.....	1,486.48	94.06
449	Jumbo Junior Mg. Co., Goldfield.....	211.80	13.40
450	Jumbo Leasing Co., Goldfield.....	16.95	1.07
451	June Bell Leasing Co., Gold Circle.....	141.94	8.98
452	June Bug Dev. Co., Las Vegas.....	1,049.12	66.38
453	Juniper Hill Mg. Co., Jungo.....	14.56	0.92
454	Juno Copper Co., Jungo.....	149.05	9.43
455	Jupiter Dev. Co., Cuprite.....	42.53	2.69
456	Jury, C. E., Jungo.....	316.33	20.02
457*	Justice Gold Mg. Co., Goldfield.....	121.48	7.69
458	Kane, Matt I., Manhattan.....	12.39	0.78
459	Kansas City Nevada Con. Mg. Co., Bruner.....	1,760.43	111.39
460	Kansas Nevada Mg. Co., Goodsprings.....	21.62	1.37
461	Kattenhorn Bros., Battle Mountain.....	646.32	40.90
462	Keane Lease, Round Mountain.....	167.91	10.62
463	Keil, J. T. (Gillispie Tunnel), Peavine.....	20.10	1.27
464	Kellogg Lease, Bullion.....	290.45	18.38
465	Kelly, J. S., Manhattan.....	85.57	2.25
466	Kelly, J. L. & Co., Battle Mountain.....	26.69	1.69
467	Kendall Lease, Goldfield.....	263.98	16.70
468	Kernick, Geo. A., Tonopah.....	381.97	24.17
469	Kiernan, Jos. B., Telluride.....	123.89	7.84
470	Kilborn Copper Canyon Mines, Copper Canyon.....	158.75	9.73
471	Kimberly Cons. Mines Co., Hilltop.....	2,138.40	135.81
472	Kimobren Leasing Co., Searchlight.....	177.24	11.21
473	Kinthead Barium Co., Mina.....	1.89	0.12
474	Kinsley Star Mg. Co., Kinsley.....	40.17	2.54
475	Kirchin, Charles (Trustee, Kirchin Mines Corp.), Luning.....	17.15	1.09
476	Kirchen Mines Corp., Luning.....	510.86	32.32
477*	Kirk Mine, Battle Mountain.....	38.32	2.42
478	Kirkeby & Gaines, Searchlight.....	29.92	1.89
479	Kotz, H. B., Virginia.....	46.26	2.93
	Forwarded.....	\$365,110.26	\$23,102.21

*Debit balance to the account of contributor has been deducted from amount of refund shown.

Div. Vr. No.	Contributor and Address	Premiums	Refund
	Forwarded.....	\$365,110.26	\$23,102.21
480	Kreft, E. E., Virginia.....	189.11	8.80
481	Laguna Mining Co., Mina.....	59.90	3.79
482*	Lang, H. H., Rochester.....	250.59	15.86
483	Last Chance Mine, Imlay.....	44.28	2.80
484	Last Hope Mining Co., Austin.....	29.77	1.88
485	LaTosca Mining Co., Oreana.....	1,298.89	82.19
486	Lawson & James, Silver City.....	55.27	3.50
487	LeChamp d'Or French G. Mg. Co., Goldfield.....	41.97	2.66
488	Legitimate Mine, Jarbidge.....	876.41	55.45
489	Lehand, W. L. & Co., Amos.....	23.25	1.47
490	Lembcke & Cordes Lease, Round Mountain.....	16.15	1.02
491	Lembcke Lease, Round Mountain.....	139.31	8.81
492	Levy, C. M., Pioneer.....	5.79	0.37
493	Liberty Gold Mines Co., Deep Creek.....	215.89	13.66
494	Liberty Gold Mining Co., Deep Creek.....	30.00	1.90
495	Liberty Mine, Liberty.....	10.98	0.69
496*	Lincoln Hill M. & M. Co., Rochester.....	488.93	30.94
497	Lind & Iroquois Copper Co., Luning.....	48.84	2.77
498	Linscott Drilling Co., Amos.....	17.30	1.09
499	Linticum, Chas., Jarbidge.....	12.94	0.82
500	Little Grey Lease, Manhattan.....	69.55	4.40
501	Little Marsh Mg. Co., Carlin.....	152.26	9.63
502	Lone Hand Lease No. 2, Tonopah.....	7.20	0.46
503	Lone Mountain Silver Lead Mg. Co., Elko.....	16.49	1.04
504	Lone Star Cons. Mg. Co., Goldfield.....	329.84	20.87
505	Longfellow Gold M. & M. Co., Gardnerville.....	551.11	84.87
506	Loring, W. J., Mill City.....	59.91	3.79
507	Lossy, W. C. (Trustees Morris Syn.), Mina.....	65.40	4.14
508	Louisa Mines, Searchlight.....	17.17	1.09
509	Louisiana Con. Mg. Co., Tybo.....	2,615.27	159.15
510	Lovelock Quicksilver Mines Co., Lovelock.....	106.43	6.73
511	Lowney Manganese Assn., Las Vegas.....	47.50	3.01
512	Luck Hill Lease, Candelaria.....	169.01	10.69
513	Lucky Boy Con. Mines Co., Lucky Boy.....	1,671.20	105.74
514	Lucky Deposit Mg. Co., Shellbourne.....	250.03	15.82
515	Lucky Girl Mg. Co., Edgemont.....	188.93	11.95
516	Luning Idaho Mining Co., Luning.....	299.92	18.98
517	Lynn Big Six M. & M. Co., Goldfield.....	600.85	38.02
518	MacLean & Doyle, Jean.....	17.23	1.09
519	MacNamara M. & M. Co., Tonopah.....	4,034.20	255.26
520	M. & D. Mg. Co., Nelson.....	24.30	1.54
521	Magnet Tungsten Mg. Co., Round Mountain.....	66.67	4.22
522	Manchester Mg. Co., Ione.....	31.20	1.97
523	Manganese Association Inc., Las Vegas.....	900.56	56.98
524	Manhattan Big Four Mg. Co., Manhattan.....	261.42	16.54
525	Manhattan Cons. Mines Dev. Co., Manhattan.....	1,696.11	107.32
526	Manhattan Morris Mg. Co., Manhattan.....	23.47	1.49
527	Manhattan Milling & Ore Co., Manhattan.....	284.87	18.03
528	Manhattan Morning Glory Mg. Co., Manhattan.....	381.67	20.99
529	Manhattan Red Top Reorg. Mg. Co., Manhattan.....	410.10	25.95
530	Manhattan Union Amal. Mines Syn., Manhattan.....	427.90	27.08
531	Manhattan Whale Mg. Co., Manhattan.....	59.02	3.73
532	Manson, F. M. (Trustee), Candelaria.....	402.88	25.49
533	Manyhouse Lease, Goldfield.....	49.50	3.13
534	Marietta Mine, Dyer.....	861.85	22.90
535	Marinette Nevada Mg. Co., Klondyke.....	298.21	18.87
536	Marion M. & M. Co., Charleston.....	130.05	8.23
537	Martin, Geo., Battle Mountain.....	6.00	0.38
538	Mason Valley Mines Co., Mason.....	12,657.91	800.93
539	May Curley Mine, Goodsprings.....	174.75	11.06
540	May Kirby Mine, Goodsprings.....	71.79	4.54
541	Mayflower Lease, Luning.....	22.10	1.40
542	Meadow Valley Leasing Co., Pioche.....	63.21	4.00
543	Means, J. H., Jarbidge.....	1,118.79	70.79
544	Mechling, F. B., Goldfield.....	413.94	26.19
545	Mendha Nevada Mining Co., Pioche.....	745.09	47.15
546	Mercury Mining Co., Ione.....	1,590.80	100.66
547	Mexican G. & S. Mining Co., Virginia.....	2,358.94	149.26
548	Middle Mines Assn., Virginia.....	325.58	20.60
549	Middletown, F. L., Jarbidge.....	22.17	1.40
550	Milford Mg. & Leasing Co., Goodsprings.....	138.11	8.74
551	Mill City Tungsten Co., Mill City.....	4.92	0.31
552	Mill City Tungsten Mg. Co., Mill City.....	610.02	38.60
553	Miller & Johnson, Las Vegas.....	57.50	3.64
554	Miller & Lappat, Rand.....	380.50	24.08
555	Miller Mountain Mg. Co., Basalt.....	40.69	2.57
556	Milliken, F. A., Pioneer.....	98.14	6.21
557	Mills, W. F., Mina.....	10.80	0.68
558	Mina Quicksilver Co., Mina.....	528.05	33.41
559	Mines Dev. Co. of Nevada, Ankeny.....	170.05	10.76
560	Minnehaha Mg. Co., Rochester.....	26.30	1.66

Forwarded.....\$407,476.26 \$25,782.89
 *Debit balance to the account of contributor has been deducted from amount of refund shown.

Div. Vr. No.	Contributor and Address	Premiums	Refund
	Forwarded.....	\$407,476.26	\$25,782.89
561	Minnesota Nevada Copper Mines Co., Yerington.....	361.70	22.89
562	Mint Mining Co., Rawhide.....	36.10	2.28
563	Mizpah Extension Mg. Co., Tonopah.....	789.29	49.94
564*	Mobile Co., Jean.....	521.88	33.02
565	Mobile Zinc Co., Goodsprings.....	127.03	8.04
566*	Mogul Mining Co., Rawhide.....	121.16	7.67
567	Mo Ho Property, Beeville.....	88.96	5.63
568	Monarch Gold Mines Co., West Comstock.....	298.90	18.91
569	Monarch-Pittsburg Mining Co., Tonopah.....	1,912.20	120.99
570	Monitor Belmont Mg. Co., Belmont.....	885.08	56.00
571	Montana Tonopah Mines Co., Tonopah.....	11,095.58	702.07
572	Montana Yerington Lease, Yerington.....	184.59	11.68
573	Montana Yerington Mine, Mason.....	35.42	2.24
574	Montana Yerington Prospect, Yerington.....	82.70	5.23
575	Monte Cristo Con. Mines Co., Jean.....	762.81	48.27
576	Montgomery Shoshone Mines Co., Rhyolite.....	140.44	8.89
577	Moonlight Mine, Ely.....	10.56	0.67
578	Morgan Perry (Aurora Con. Mines), Aurora.....	89.61	5.67
579	Mount Grant Mg. Co., Hawthorne.....	58.80	3.72
580	Mount Helen Dev. Co., Contact.....	110.63	6.99
581	Mount Montgomery Mercury Co., Mount Montgomery.....	275.86	17.45
582	Mountain Top Mine, Goodsprings.....	87.95	5.57
583	Muncy Creek Mg. Co., Aurum.....	119.11	7.54
584	Murphy & Johnson, Palmetto.....	9.44	0.60
585	McCarthy, J. J. (Agent), Manhattan.....	49.52	3.13
586	McConnell Mines Co., Mason.....	561.91	35.55
587	McCormac, Tom, Indian Springs.....	1,391.32	88.04
588	McCormack & McMahon, Yerington.....	26.80	1.70
589	McCoy Mines, McCoy.....	19.70	1.25
590	McCoy-Downer Lease, Goldfield.....	381.42	24.13
591	McCrea, W. R., Reno.....	8.40	0.53
592*	McDevit & Duffie, Luning.....	16.50	1.04
593	McDonald, A. M., Bullionville.....	260.71	16.50
594	McDonald Ely Copper Co., Ely.....	319.62	20.22
595	McFadden Leasing Co., Bristol.....	64.03	4.05
596	McGhan, M. E., Round Mountain.....	18.79	1.19
597	McGinnis, R. B., Manhattan.....	48.96	3.10
598	McGregor & Johnson, Galena.....	49.36	3.12
599	McKeough, W. J., Aurora.....	1.75	0.11
600	McKeough & Scott, Aurora.....	7.95	0.50
601*	McLaughlin & Peterson, Bullion.....	8.05	0.51
602	McNamara, Harry, Tonopah.....	181.82	11.50
603	McUichie & Smoot Bros., Ferber.....	38.24	2.42
604	Nancy Donaldson Mg. Co., Goldfield.....	86.91	5.50
605	Natchez Mg. Co., Mill City.....	498.85	31.22
606	National Antimony Co., Unionville.....	179.06	11.33
607	National Leasing Co., National.....	341.61	21.62
608	National Mines Co., National.....	5,798.12	366.87
609	National Treasure Mines Co., National.....	5.40	0.34
610	Nelson, C. J., Jarbridge.....	120.01	7.59
611	Nenzel Crown Point Mg. Co., Rochester.....	1,087.37	68.80
612	Neuebaumer, E., Manhattan.....	124.28	7.86
613	Nevada Almaden Mx. Co., American Canyon.....	8.50	0.22
614	Nevada Alum Syndicate, Blair Junction.....	70.09	4.43
615	Nevada Antimony Co., Antelope Springs.....	119.17	7.54
616	Nevada Austin Mines Co., Austin.....	254.15	16.08
617	Nevada Bunker Hill Mg. Co., Bullion.....	301.72	19.09
618	Nevada Central Copper Co., Cedar.....	188.46	11.61
619	Nevada Champion Copper Co., Luning.....	959.08	60.69
620*	Nevada Chief Mg. Co., Goldyke.....	36.01	2.28
621	Nevada Cinnabar Co., Ione.....	1,916.17	121.25
622	Nevada Cooperative Mg. Co., Goldfield.....	96.82	6.11
623	Nevada Copper Mfg., Mlg., & Power Co., Contact.....	124.35	7.87
624	Nevada DeMoines Mg. Co., Pioche.....	27.63	1.75
625	Nevada Dividend Mg. Co., Mud Springs.....	105.58	6.68
626	Nevada Douglas Cons. Copper Co., Ludwig.....	8,289.89	524.54
627	Nevada Eagle Mg. Co., Goldfield.....	57.17	3.62
628	Nevada Equity Mines Co., Copper Canyon.....	167.29	10.69
629	Nevada Exploration Co., Mill City.....	7.35	0.47
630	Nevada Gold Mines Co., Luning.....	174.49	11.04
631	Nevada Hills Mg. Co., Fairview.....	7,137.73	451.64
632	Nevada Hills Mg. Co. (Elmore Claims), Jarbridge.....	222.65	14.09
633	Nevada Humboldt-Tungsten Mines Co., Mill City.....	547.92	34.67
634	Nevada Lime & Plaster Co., Sloan.....	1,797.32	113.72
635	Nevada Lincoln Mg. Co., Lincoln.....	98.20	6.21
636	Nevada Manganese Co., Shafter.....	154.22	9.76
637	Nevada Milling Co., Tonopah.....	18.31	1.16
638	Nevada Mine, Hamilton.....	160.30	10.14
639	Nevada Mining & Dev. Co., Manhattan.....	67.73	4.29
640*	Nevada New Mines Co., Rawhide.....	3,781.03	239.24
	Forwarded.....	\$464,251.97	\$29,875.85

*Debit balance to the account of contributor has been deducted from amount of refund shown.

Div. Vv. No.	Contributor and Address	Premiums	Refund
	Forwarded.....	\$464,251.97	\$29,375.85
641	Nevada Ophir Mfg. Co., Tybo.....	76.66	4.84
642	Nevada Ore & Copper Co., Acme Tanks.....	719.67	48.54
643	Nevada Pacific Copper Co., Luning.....	86.78	2.33
644	Nevada Packard Mines Co., Packard.....	6,166.82	390.20
645	Nevada Pioneer Gold Mining Co., Pioneer.....	6.75	0.43
646	Nevada Progressive Gold Mining Co., Wellington.....	208.19	12.98
647	Nevada Quicksilver Co., Mina.....	165.26	10.46
648	Nevada Rand Mines Co., Rand.....	288.68	15.10
649	Nevada Scheelite Co., Ely.....	529.81	33.52
650	Nevada Standard Copper Co., Mina.....	380.99	24.11
651	Nevada Star Mfg. Co., Cherry Creek.....	84.73	5.86
652	Nevada Star Mining Co., Ltd., Cherry Creek.....	895.57	56.67
653	Nevada Sulphur Co., Sulphur.....	801.82	50.70
654	Nevada United (W. J. Cox, Lessee), Ward District.....	143.25	9.06
655	Nevada United Mines Co., Ely.....	66.40	4.20
656	Nevada United Mines Leasing Co., East Ely.....	918.98	58.15
657	Nevada Wonder Mfg. Co., Wonder.....	25,793.29	1,632.06
658	Nevada Zinc Mfg. Co., Warm Springs.....	1,189.91	75.29
659	New Golden Crown Mfg. Co., Tonopah.....	21.16	1.34
660	New Jersey Mines Co., Goldfield.....	646.94	40.93
661	New Tuscarora Mining Co., Tuscarora.....	262.09	16.58
662	New Year Mine, Goodsprings.....	129.49	8.19
663	New Yerington Copper Co., Yerington.....	96.72	6.12
664	Nichols-Layng Chemical Co., Austin.....	145.67	9.22
665	Nicklass Mfg. Co., Battle Mountain.....	1,790.99	113.32
666	Nightingale Mine, Nightingale Range.....	94.22	5.96
667	Ninety-Nine Mine, Goodsprings.....	75.97	4.81
668	Nixon Nevada Mfg. Co., Granite Mountain.....	1,883.37	119.17
669	Noble & Spenser Lease, Sodaville.....	89.48	5.66
670	Oatman Imperial Mines Co., Sylvaia.....	168.86	10.68
671	Oberto & Dellange, Manhattan Gulch.....	14.44	0.91
672	O'Kelly, F. C. (Goodsprings Dividend), Goodsprings.....	187.98	11.89
673	Olga Lease, Mina.....	95.71	6.06
674	Olympic Mines Co., Mina.....	1,529.97	96.81
675	Onondago Lease—Day Leasing Co., Jackrabbit.....	28.35	1.79
676	Onondago Mines Co., Palisade.....	220.91	13.98
677	Ophir Silver Mining Co., Virginia.....	3,363.56	212.83
678	Oregon Short Line Lease, Pioche.....	14.84	0.91
679	Original Rochester Mines Co., Rochester.....	532.54	33.70
680	Orizaba Mfg. & Dev. Co., Orizaba.....	114.18	7.22
681	Orleans Mine, Hornsilver.....	274.67	17.38
682	Orleans M. & M. Co., Hornsilver.....	207.02	13.10
683	Oro Amigo Platino Mfg. Co., Goodsprings.....	473.08	29.93
684	Orofino Dev. Co., Railroad Springs.....	35.71	2.26
685	Orr, Mrs., Pennsylvania, Humboldt County.....	54.47	3.45
686	Osterland & Watson Lease, Hunter.....	13.30	0.84
687	Overland Con. Mfg. Corp., Gold Hill.....	32.07	2.03
688	Overman Mfg. Co., Gold Hill.....	562.46	35.59
689	Pacific Portland Cement Co., Mound House.....	6,081.80	381.66
690	Pacific Tungsten Co., Mill City.....	345.77	21.88
691	Packard North Ext. Mfg. Co., Packard.....	198.60	12.57
692*	Palisade Copper Co., Bullion.....	85.04	5.38
693	Palmetto Con. Mfg. Co., Palmetto.....	270.55	17.12
694*	Pamlico Placer Co., Hawthorne.....	23.02	1.46
695	Paradise Copper Mine, Willow Pt.....	220.01	13.92
696	Patrick, Charles G., Goldfield.....	2.21	0.14
697	Patrick Wm. Mfg. Co., Manhattan.....	54.42	3.44
698	Paul, Frank, Battle Mountain.....	476.13	30.13
699	Paymaster Lease, Tonopah.....	14.04	0.89
700	Paymaster Mine, Poerville.....	8.82	0.56
701	Payroll Mfg. Co., Crow Springs.....	78.20	4.95
702	Peak Mines Co., Silver Peak.....	31.45	1.99
703	Peavine Mining & Dev. Co., Reno.....	16.65	1.05
704	Pembroke & Winwood, Locomo, Utah.....	86.00	5.44
705	Pennington Shaft Lease, Yerington.....	441.65	27.95
706	Pepper & Keough, Mina.....	7.20	0.46
707	Perkins, A. E., Terrello Camp.....	16.24	1.03
708	Phillips Lindstrom Lease, Manhattan.....	150.03	9.49
709	Phonolite Paymaster Mfg. Co., Bruner.....	164.49	10.41
710	Phonolite Silent Friend Mfg. Co., Bruner.....	77.15	4.88
711	Pick and Shovel Lease, Jarbridge.....	11.57	0.73
712	Pilgrim Mfg. Co., Goodsprings.....	14.38	0.91
713	Pilot Copper Co., Luning.....	151.64	9.59
714	Pine Grove Nevada Gold Mfg. Co., Pine Grove.....	859.63	54.89
715	Pioche Bristol Mfg. Co., Pioche.....	68.54	4.34
716	Pioche Mines Co., Sauer.....	461.27	29.19
717	Pioneer Con. Mines Co., Pioneer.....	897.89	56.81
718	Pioneer Yellow Jacket Mfg. Co., Pioneer.....	344.01	21.77
719	Pittsburg Dolores Mfg. Co., Yerington.....	4,591.50	290.50
720	Pittsburg Red Top Mfg. Co., Maysville.....	224.74	14.22
	Forwarded.....	\$532,255.84	\$33,678.26

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Div. Vr. No.	Contributor and Address	Premiums	Refund
	Forwarded.....	\$532,255.84	\$33,678.26
721	Pittsburg Silver Peak Gold Mg. Co., Blair.....	6,241.11	394.90
722	Pittsburg Silver Peak Mg. Co., Blair.....	1,456.55	92.16
723	Platino Mines Corp., Goodsprings.....	133.31	8.44
724	Platinum Gold Mg. Co., Goodsprings.....	280.94	17.78
725	Platt, E. H., Lease, East Ely, Ward.....	300.87	19.04
726	Pony Express Mg. & Mlg. Co., Osceola.....	46.96	2.97
727	Poppy Knickerbocker Platinum Co., Goodsprings.....	30.16	1.91
728	Potosi Mg. Co. (Empire Zinc Co.), Arden.....	9,426.86	596.48
729	Prairie Flower Dev. Co., Goodsprings.....	266.05	16.83
730	Perkins, E. E. (Adams Lease on Duplex), Searchlight.....	35.75	2.26
731	Prairie Flower Mg. Co., Goodsprings.....	110.34	6.98
732	Preston Lease, Masuma.....	65.30	4.13
733	Preston, R. M., Lease, Rochester.....	32.45	2.05
734	Prickard, C., Paradise Mountain.....	80.78	5.11
735	Prince Con. Mg. & Smelt. Co.....	13,818.74	874.38
736*	Puels, Robert, Goodsprings.....	443.44	28.06
737	Putney, Arthur S., Manhattan.....	212.45	13.44
738	Pyramid Lake Mg. & Dev. Co., Sutcliff.....	55.95	3.54
739	Quartette Mg. Co., Searchlight.....	1,111.53	70.33
740	Queen Mg. Co., Nelson.....	115.55	7.31
741	Queen & Rover Mines, Nelson.....	104.40	6.61
742*	Queen Regent Merger Mg. Co., Rand.....	75.00	4.75
743	Quinn Cons. Mine, Silver City.....	51.03	3.23
744*	Quintette Exploration Co., Copper Basin.....	33.25	2.10
745	Rader & Francisco, Tonopah.....	27.60	1.75
746	Rader & Lowe, Tonopah.....	9.00	0.57
747	Ragged Top Leasing Co., Ragged Top.....	43.41	3.06
748	Ralph Bros., Copper Canyon.....	111.91	7.08
749	Rand Mineral Co., Fanning.....	79.40	5.02
750	Rand Mining Co., Searchlight.....	873.25	55.25
751	Randolph, C. H., Syn., Klondyke.....	7.20	0.46
752*	Rasmussen, R. P., Luning.....	5.74	0.36
753	Rebel Creek Gold Mining Co., Rebel Creek.....	149.12	9.44
754	Red Hill Florence Mining Co., Goldfield.....	1,208.67	76.48
755	Red Metals Co., Reno.....	326.38	20.65
756	Red Metals Dev. Co., Ely.....	159.18	10.07
757	Red Streak Copper Mining Co., Goodsprings.....	197.71	12.51
758	Reinhard & Good, Goldfield.....	41.53	2.63
759	Reneaux & Schwartz, Goodsprings.....	150.63	9.53
760	Reno Peavine Mines, Reno.....	0.95	0.06
761	Reno Yerington Lease, Yerington.....	43.84	2.77
762	Reorganized Blue Bull Mg. Co., Goldfield.....	1,229.94	77.82
763	Reorganized Booth Mg. Co., Goldfield.....	359.48	59.45
764	Reorganized Cracker Jack Mg. Co., Goldfield.....	942.45	59.63
765	Reorganized Kewanas Mg. Co., Goldfield.....	1,558.09	100.80
766	Republic Mining Co., Sodaville.....	109.79	6.95
767	Rescue Eula Mg. Co., Tonopah.....	4,777.23	302.23
768	Reservation Hill Mg. & Mlg. Co., Schurz.....	85.74	5.43
769	Rex Leasing Co., Midas.....	25.00	1.58
770	Rex Mines Co., Midas.....	176.05	11.14
771	Reymond, Louis, Midas.....	49.15	3.11
772	Richmond-Eureka Mg. Co., Eureka.....	695.86	44.03
773	Richmond, F. C., Machinery Co., Pioche.....	312.07	19.75
774*	Richmond Mg. Co., Granite Creek.....	26.15	1.65
775	Riechel, Henry, Luning.....	5.60	0.35
776	Rio Grande Grubstake Mg. Co., Schurz.....	337.90	21.38
777*	Rip Van Winkle Mine, Lone Mountain.....	46.88	2.93
778	Rives, B. A. (Trustee), Blair.....	60.60	3.88
779	Robb & Phillips, Manhattan.....	20.16	1.23
780	Rochester Belmont Mg. Co., Rochester.....	139.55	8.83
781	Rochester Big Four Mg. Co., Rochester.....	771.40	48.81
782	Rochester Combined Mines Co., Lower Rochester.....	5,028.67	318.19
783	Rochester Con. Mg. & Mlg. Co., Rochester.....	10.83	0.69
784	Rochester Crown Point Mg. Co., Rochester.....	110.98	7.02
785	Rochester Elda-Fino Mg. Co., Rochester.....	277.45	17.56
786	Rochester Foreman Lease, Rochester.....	101.00	6.39
787	Rochester Gold Coin Mg. Co., Rochester.....	201.86	12.77
788*	Rochester Hills Mg. Co., Rochester.....	1,347.77	85.28
789	Rochester Home Trail Mines Co., Lower Rochester.....	21.48	1.36
790	Rochester Limerick Mines Co., Rochester.....	66.39	4.20
791	Rochester Merger Mines Co., Rochester.....	1,778.08	112.51
792	Rochester Mines Co., Rochester.....	11,913.64	753.33
793	Rochester Nugget Mg. Co., Rochester.....	89.64	5.67
794	Rochester United Mines Co., Rochester.....	178.73	11.31
795	Rochester Weaver Mg. Co., Rochester.....	122.84	7.77
796	Rock Hill Mining Co., Mill City.....	38.99	2.47
797	Rock Hill Placer Co., Mill City.....	268.10	16.96
798	Rock Mg. & Leasing Co., Rochester.....	48.00	3.04
799	Rockland Mg. Co., Rockland.....	196.53	12.44
800	Root, S. C., Goodsprings.....	80.38	5.09
	Forwarded.....	\$604,450.08	\$38,246.32

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Div. Vr. No.	Contributor and Address	Premiums	Refund
	Forwarded.....	\$604,450.08	\$38,246.33
801	Root Zinc Mg. Co., Goodsprings.....	807.19	19.44
802	Rosabie Mg. & Mlg. Co., Millers.....	194.67	12.32
803	Rosenberg, A. L., Rawhide.....	7.35	0.47
804	Rosenberg & Chechore, Ellsworth.....	12.28	0.78
805	Ross, Hart, Haire, Lease, Yerington.....	226.15	14.31
806	Roth, Geo. E., Jean.....	64.99	4.11
807	Round Mountain Mg. Co., Round Mountain.....	14,796.36	936.24
808	Round Mountain Placer Co., Round Mountain.....	1,077.92	68.21
809	Rover Cons. Mg. Co., Nelson.....	172.09	10.89
810	Roy Development Co., Mina.....	41.23	2.61
811	Roylance Reduction Co., Kennedy.....	196.31	12.42
812	Ruby Hill Mine, Gardnerville.....	229.94	14.55
813	Ruby Mining Co., El Dorado Canyon.....	8.50	0.22
814	Rye Grass Mines Co., Union.....	675.28	42.72
815	Saint Anthony Mines, Toy.....	1,410.05	89.22
816	Saint Anthony Mg. Co., Goodsprings.....	290.10	18.36
817	Salt Lake Tungsten Mines Co., Tungstonia.....	497.80	31.50
818	Sampson, C. M., Bristol.....	2.70	0.17
819	Sam Yet Mg. Co., Searchlight.....	40.78	2.58
820	San Antonio Placer Co., Manhattan.....	60.52	3.83
821	Sandstorm-Kendall Con. Mg. Co., Goldfield.....	1,811.19	114.60
822	Santa Fe Mg. Co., Searchlight.....	12.38	0.78
823	Savage Gold & Silver Mg. Co., Virginia.....	187.76	10.61
824	Schrader, E. J., Yerington.....	71.88	4.55
825	Scott, E. L., Aurora.....	7.84	0.50
826	Searchlight Goodenough M. & M. Co., Searchlight.....	17.85	1.12
827	Seattle Contact Copper Co., Contact.....	1,877.35	118.79
828	Sebastapol Mg. Co., Schurz.....	31.25	1.98
829	Seg. Belcher & Midas Con. Mg. Co., Gold Hill.....	6.78	0.42
830	Seven Troughs Coalition Mg. Co., Seven Troughs.....	8,655.05	547.65
831	Seven Troughs Mg. Co., Vernon.....	769.08	48.66
832	Sheba Gold & Silver Mg. Co., Imlay.....	419.84	26.57
833	Shelby, Mrs. A. E., Lovelock.....	19.95	1.26
834	Shipper Copper Co., Luning.....	238.18	14.75
835	Shoup, George J., Midas.....	621.89	39.82
836	Shoup, Geo. J., Jarbidge.....	592.95	37.52
837	Shurtliff & McCoy Lease, Cherry Creek.....	34.83	2.17
838	Siebert, F. J. (Trustee), Mina.....	286.58	18.13
839	Sierra Nevada, Mexican & Union Shaft Co., Virginia.....	2,832.34	179.22
840	Sierra Nevada Mg. Co., Virginia.....	2,046.16	129.47
841	Silgoled Mg. Co., Pioche.....	161.29	10.21
842	Silver Bell & Alpha Con. Mines Co., Rye Patch.....	25.00	1.58
843	Silver Bow Bell Mg. Co., Silver Bow.....	2.40	0.15
844	Silver Dyke Mine, Sodaville.....	17.67	1.12
845	Silver Field Mining Co., Ltd., Battle Mountain.....	77.39	4.90
846	Silver Hill Leasing Co., Silver City.....	71.60	4.53
847	Silver Hill M. Co., Silver City.....	6.00	0.38
848	Silver King Property, Eureka.....	68.80	4.01
849	Silver Mines Corp., Hornsilver.....	1,718.92	108.76
850	Silver Pick Con. Mines Co., Goldfield.....	3,206.64	202.90
851	Silver Pick Mg. & Dev. Co., Goldfield.....	52.09	3.30
852	Silver Queen Mg. & Leasing Co., Hamilton.....	91.45	5.79
853	Silver Star Mg. Co., Cobre.....	53.69	3.40
854	Simon, P. A. (Lead Mine), Mineral.....	241.39	15.27
855	Simon & Bradshaw, Candelaria.....	61.91	3.92
856	Singer Lease, The, Goodsprings.....	134.65	8.52
857	Sleeping Beauty Mg. Co., Midas.....	65.42	4.14
858	Slumbering Hills Mines Co., Amos.....	19.51	1.23
859	Smithsonite Mine, Goodsprings.....	258.53	16.36
860*	Smokey Dev. Co., Ely.....	145.46	9.20
861	Snowshoe Mg. Co., Lincoln.....	119.25	7.55
862	Sommers & Elbert, Yerington.....	38.02	2.41
863	South Nevada Gold Mg. Co., Las Vegas.....	401.81	25.42
864	Southwestern Mines Co., Hornsilver.....	38.65	2.45
865	Spanish Belt Silver Mine, Inc., Spanish Belt.....	12.53	0.79
866	Spanish Springs Mg. Co., Spanish Belt.....	219.58	13.89
867	Spearhead Gold Mg. Co., Goldfield.....	1,371.83	86.80
868	Spencer & Allured, Goodsprings.....	90.92	5.75
869	Standard Metals Co., Reno.....	543.44	34.89
870	Star Peak Mine, Humboldt.....	763.54	48.31
871	Starr & McKinzie Lease, Como.....	22.87	1.45
872	Steffner Con. Leasing Co., Manhattan.....	64.33	4.07
873	Steppich, Nick, & Co., Manhattan.....	11.45	0.72
874*	Stevenson & Weber, Round Mountain.....	17.15	1.09
875*	Stewart Mining Co., Lone Mountain.....	152.78	9.67
876	Storey Co. Mines Co., Ramsey.....	535.66	33.89
877	Success Con. Mg. & Mlg. Co., Jarbidge.....	7.35	0.47
878	Sultan Mine, Goodsprings.....	1,759.68	111.34
879	San Copper Co., Bullion.....	24.70	1.56
880	Sunflower Mg. Co., Lone Mountain.....	244.04	15.44
	Forwarded.....	\$658,186.22	\$41,646.49

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Div. Vr. No.	Contributor and Address	Premiums	Refund
	Forwarded.....	\$658,186.22	\$41,646.49
881	Sunnyside Mines, Goodsprings.....	17.00	1.08
882	Sunset Mg. & Dev. Co., Rhyolite.....	1,588.09	100.49
883	Superior & Nevada Gold M. & M. Co., Crescent.....	6.90	0.44
884	Sutherland Antimony Mines, Black Knob Dist.....	30.18	1.91
885	Sweepstakes Mg. Co., Bullion.....	180.71	11.48
886	Talaposa Mg. Co., Fernley.....	48.26	8.05
887	Tallulah Mine, Mill City.....	20.14	1.27
888	Talmage Gold Mines Co., Goldfield.....	185.46	11.73
889	Tarbell, C. W., Unionville.....	5.78	0.37
890	Techaticup Mg. Co., Nelson.....	5,476.15	346.50
891	Techow, Walter, Virginia.....	96.96	6.14
892	Techow Water House Mg. Co., Virginia.....	140.05	8.86
893	Telluride Con. Quicksilver Mg. Corp., Ltd., Beatty.....	394.59	24.97
894	Tempest Lease, Bristol.....	93.50	5.92
895	Tempest Leasing Co., Bristol.....	42.00	2.66
896	Tenabo Mill & Mining Co., Cortez.....	263.75	16.69
897	Theo, N. P., Hornsilver.....	41.64	2.63
898	T. H. & N. Lease, Jumbo.....	23.45	1.48
899	Thorndyke-Bley Mg. Co., Sunland.....	20.86	1.32
900	Thursday Fraction, Manhattan.....	125.95	7.97
901	Tilford Mine (Atkins, Kroll & Co.), Osceola.....	207.95	13.16
902	Todd, R. B., Mg. Co., Luning.....	123.64	7.82
903	Tohoqua Mg. Co., Leadville.....	1,947.21	123.21
904	Tonopah Belmont Dev. Co., Tonopah.....	56,905.64	3,600.88
905	Tonopah Bonanza Mg. Co., Tonopah.....	989.98	62.84
906	Tonopah Cash Boy Con. Mg. Co., Tonopah.....	1,401.90	88.70
907	Tonopah Divide Mg. Co., Tonopah.....	573.32	36.28
908	Tonopah Dividend Mg. Co., Gold Mountain.....	33.43	2.12
909	Tonopah East End Dev. Co., Tonopah.....	181.91	10.24
910	Tonopah Extension Mg. Co., Tonopah.....	44,975.57	2,845.82
911	Tonopah Gipsy Queen Mg. Co., Tonopah.....	1,636.06	103.52
912	Tonopah Gold Zone Mg. Co., Gold Mountain.....	10.90	0.69
913	Tonopah Hasbrouck Mg. Co., Tonopah.....	25.65	1.62
914	Tonopah Kawich M. & M. Co., Bellehelen.....	158.77	10.05
915	Tonopah Leasing & Mg. Co., Tonopah.....	65.52	4.15
916	Tonopah Liberty Mg. Co., Tonopah.....	82.45	5.22
917	Tonopah Merger Mg. Co., Tonopah.....	1,815.43	114.87
918	Tonopah Midway Mg. Co., Tonopah.....	3,868.64	244.79
919	Tonopah Midway Cons. Mg. Co., Tonopah.....	904.22	57.21
920	Tonopah Mining Co. of Nevada, Tonopah.....	36,391.24	2,302.64
921	Tonopah North Star T. & D. Co., Tonopah.....	3,594.06	227.41
922	Tonopah Victor Mg. Co., Tonopah.....	1,102.65	69.77
923	Top Not Mine, Manhattan.....	98.57	6.24
924	Train Chase Lease, Manhattan.....	65.07	4.12
925	Trankle, McLeod & Holland, Yerington.....	8.70	0.55
926	Trimble, R. A., Dayton.....	21.84	1.38
927	Trinity Leasing Syn., Sunland.....	489.54	30.98
928	Trojan Mining & Leasing Co., Jumbo.....	56.78	3.59
929	Tullock Mines Co., Pioche.....	71.90	4.55
930	Tungsten Comet Mr. Co., Panaca.....	284.81	18.02
931	Tungstania Mg. & Mlg. Co., Tungstania.....	375.89	23.78
932	Turner & Griffith, Round Mountain.....	1.20	0.08
933	Turner Dunn Leasing Co., Hornsilver.....	20.64	1.31
934	Tuscarora Nevada Mines Co., Tuscarora.....	62.85	3.98
935	Twin Buttes Leasing Co., Millers.....	70.08	4.43
936	Tybo Extension Mg. Co., Tybo.....	50.00	3.16
937	Tybo Lead Co., Tybo.....	23.69	1.50
938	Tybo Leasing Syn., Tybo.....	30.62	1.94
939	Umatilla Tonopah Mg. Co., Tonopah.....	846.47	53.56
940	Union Amalgamated Mg. Co., Manhattan.....	1,375.96	87.06
941	Union Amalgamated Ext. Mg. Co., Manhattan.....	70.75	4.48
942	Union Consolidated Mg. Co., Virginia.....	8,184.29	517.86
943	Union Mines Co., Union.....	2,091.71	132.85
944	United Comstock Pumping Assn., Virginia.....	11,305.20	715.33
945	United Mining Co., Carson City.....	161.82	10.24
946	United States Smelting Ref. Mg. & Exp. Co., Ludwig.....	144.90	9.17
947	United States Tungsten Corp., Ely.....	2,770.63	175.31
948	Uvada Copper Co., Pioche.....	2,980.65	185.44
949	Uvada Mining Co., Reno.....	107.28	6.79
950	Valentine Mine, Jean.....	626.20	39.62
951	Vernal Mg. Co., Diamondfield.....	110.94	7.02
952	Vesuvius Lease, Bristol.....	42.06	2.66
953	Victoria Copper Co., Currie.....	111.22	7.04
954	Villa Mine, The, Las Vegas.....	5.40	0.34
955	Virginia Louise Mg. Co., Pioche.....	248.17	15.70
956	Wagner Azurite Copper Co., Luning.....	455.02	28.79
957	Wagner Copper Co., Goldfield.....	80.95	1.96
958	Wagner, Edward, Sodaville.....	587.43	37.17
	Forwarded.....	\$857,906.01	\$54,283.71

*Debit balance to the account of contributor has been deducted from amount of refund shown.

Div. Vr. No.	Contributor and Address	Premiums	Refund
	Forwarded.....	\$857,906.01	\$54,288.71
959	Walker, J. W., Cherry Creek.....	80.21	1.91
960	Walker River Copper Co., Yerington.....	115.61	7.32
961	Wall Lease, Manhattan.....	35.82	2.27
962	Wall Street Copper Co., Luning.....	7,247.91	458.61
963	Wall Street Mines Co., Searchlight.....	83.34	5.27
964	Wallace, Frank, Mason.....	37.75	2.39
965	Wallace, G. W., Reno.....	16.02	1.01
966	Walsh & Rackliff, Luning.....	249.69	15.80
967	Warmack Gold Mg. Co., Golconda.....	56.45	3.57
968	Warren & Lobb, New York Canyon.....	13.15	0.83
969	Washington Mine, Eureka.....	8.40	0.53
970	Washington & Nevada Dev. Co., Jumbo.....	103.40	6.54
971	Water Witch Mines Co., Midas.....	61.50	3.89
972	Watson, C. E. (Agent), Battle Mountain.....	31.87	1.98
973	Webster Mines Corp., Grantsville.....	192.37	12.17
974	Webster, Paul, Sulphur.....	25.20	1.59
975	Wedge Copper Co., Luning.....	379.38	24.01
976	Welk, Kennedy & Davis, Goodsprings.....	5.10	0.32
977	Werner & Van Winkle, Ely.....	77.08	4.88
978	West Coast Mines Co., Rawhide.....	3.00	0.19
979	West End Con. Mg. Co., Tonopah.....	14,270.86	902.98
980	West End Con. Mg. Co. & Cave Springs Acct., Tonopah.....	6,564.13	415.34
981	West End Con. Mg. Co., Cave Springs.....	144.54	9.16
982	West Mining Co., Barth.....	2,660.56	168.35
983	West Tonopah Con. Mg. Co., Tonopah.....	1,468.08	92.89
984	Western Metals Co., Lovelock.....	55.37	3.50
985	Western Mines Dev. Co., Ferber.....	284.03	17.97
986	Western Mining Co., Battle Mountain.....	52.50	3.32
987	Western Silica Co., Beatty.....	10.89	0.66
988	Whale Mine, Goodsprings.....	15.80	0.97
989	Whale Mg. Co., Goodsprings.....	634.53	40.15
990	Wheeler Gold Mine Co., Yerington.....	75.91	4.80
991	Wheeler Mine Lease, Pine Grove.....	53.82	3.37
992	Wheeling Gold Range Mg. Co., Sodaville.....	12.76	0.81
993	White Caps Extension Mines Co., Manhattan.....	719.16	45.50
994	White Caps Leasing Co., Manhattan.....	209.74	13.27
995	White Caps Mg. Co., Manhattan.....	5,971.09	377.82
996	White Pine Lead Co., Hamilton.....	337.01	21.82
997	White Pine Mining Co., Goodsprings.....	93.70	5.93
998	Whitney, B. L., Jean.....	14.00	0.89
999	Willets & Co., Manhattan.....	88.16	5.58
1000	Williams, D. C., Ruby Valley.....	27.63	1.75
1001	Williams, I. M., Round Mountain.....	1.40	0.09
1002	Williams, Robert (Sunnyside Mines), Goodsprings.....	32.24	2.04
1003	Williamson Mg. Co., Reno.....	24.87	1.54
1004	Willis & Cramer, Copper Basin.....	6.60	0.42
1005	Willow Creek Gold Mg. Co., Willow Creek.....	208.91	13.23
1006	Willow Creek Mg. Co., Willow Creek.....	240.78	15.24
1007	Wilson Point Lease, Manhattan.....	102.22	6.47
1008	Windisch & Robohm, Silver.....	229.43	14.52
1009	Wingfield, Geo., Goldfield.....	367.22	23.24
1010	Winnemucca Mountain Mg. Co., Winnemucca.....	1,479.92	98.65
1011	Wisconsin Yerington Copper Co., Yerington.....	34.20	2.17
1012	Wittenburg, C. F., Eureka.....	448.33	28.37
1013	Wittenburg Mushett Lease, Manhattan.....	2,292.54	145.06
1014	Wittenburg & Salsberry, Manhattan.....	124.75	7.90
1015	Wittenburg, Wheeler & Vignola, Willow Creek.....	48.20	3.05
1016	Wolverine Mines Co., Winnemucca.....	49.90	3.16
1017	Wyman & Richards, Mineral.....	4.82	0.30
1018	Weck & Elbert, Mason.....	66.82	4.23
1019	Yankee Blade Con. Mg. Co., Austin.....	7.14	0.46
1020	Yellow Dog Mg. Co., Dyke.....	9.00	0.57
1021	Yellow Jacket G. & S. Mg. Co., Gold Hill.....	372.86	23.60
1022	Yellow Pine Extension Mg. Co., Goodsprings.....	157.90	10.00
1023	Yellow Pine Mg. Co., Goodsprings.....	11,787.41	745.85
1024	Yellow Tiger Mg. Co., Goldfield.....	398.17	25.20
1025	Yerington Mt. Copper Co., Golconda.....	1,623.39	102.72
1026	Yerington Mt. Copper Co., Schurz.....	1,602.74	101.42
1027	Yerington Mt. Copper Co., Phonolite.....	44.71	2.83
1028	Yount & Fagle (Bullion Mine), Jean.....	665.67	42.13
1029	Yuba East Mine, Pioche.....	80.05	1.91
1030	Yuba Leasing & Dev. Co., Pioche.....	570.92	36.13
1031	Zannini & Co., Manhattan.....	35.72	2.27
		\$923,510.16	\$58,484.89

*Debit balance to the account of contributor has been deducted from amount of refund shown.

Class 3

NEVADA CONSOLIDATED COPPER COMPANY

(Mining, Milling, and Smelting)

<i>Dis.Vr. No.</i>	<i>Contributor and Address</i>	<i>Premiums</i>	<i>Refund</i>
1082	Curtis, J. H., McGill.....	\$2,972.05	\$810.88
1088	Nevada Con. Copper Co., Ruth & Kimberly.....	155,848.46	16,220.00
1084	Nevada Con. Copper Co., McGill.....	85,042.36	3,658.91
1085	Steptoe Valley Smelting & Mg. Co., McGill.....	118,985.09	11,896.89
		\$307,292.96	\$32,085.63

Class 2

MILLING AND ORE REDUCTION

No refund. Amounts shown represent premium payments to June 30, 1918.

<i>Contributor and Address</i>	<i>Premiums</i>
Ackerman, Geo. B., Douglas.....	\$6.92
Amalgamated Pioche M. & S. Corp., Pioche.....	1,088.77
American Carrara Marble Co., Carrara.....	187.43
American Onyx Co., Manhattan.....	4.99
Antelope Springs Mining Co., Jungo.....	65.48
Antimony & Silver Mines Co., Galena Canyon.....	93.48
Antimony Syndicate, Unionville.....	69.20
Arden Plaster Co., Arden.....	666.58
Arthur Zinc Mg. Co., Ruby Valley.....	8.95
Atkins, Kroll & Co., Osceola.....	80.79
Aurora Con. Mines Co., Aurora.....	5,028.84
Austin, E. A., Jarbidge.....	10.90
Battle Mountain Mines & Dev. Co., Copper Basin.....	81.19
Beedle, F. C. (Lessee), Candelaria.....	18.51
Belleville Tailings Assn., Belleville.....	1,594.71
Belmont Milling Co., Tonopah.....	6,667.49
Big Casino Mining Co., Searchlight.....	41.28
Big Four Exploration Co., Ruby Valley.....	50.08
Big Pine Mg. Co., Manhattan.....	8.85
Black Eagle Gold Mg. Co., Rawhide.....	382.34
Bluestone Mg. & Smelting Co., Mason.....	1,847.61
Bluster Consolidated Mines Co., Jarbidge.....	107.04
Boss G. Mining Co., Goodsprings.....	77.89
Brady, S. H. & Co., Jefferson Canyon.....	649.56
Brock & Meagel, Reveille.....	55.73
Buckhorn Mines Co., Buckhorn.....	1,054.27
Buffalo Valley Gold Mines Co., Ankeny.....	15.19
Bullion Mg. Co., Jean.....	285.59
Burke, J. J. & Co., Ione.....	69.21
Butters, Chas. & Co. Ltd., Virginia.....	447.72
Cahill, E. G., Mina.....	246.62
Campbell & Kelly, Tonopah.....	72.55
Carrara Mg. & Mlg. Lsg. Syn., Carrara.....	5.65
Catlin, R. M., Elko.....	97.80
Catlin Shale Prod. Co., Elko.....	33.58
Cebrian, Edwards, Searchlight.....	178.52
Chief of the Hills Gold Mg. Co., Searchlight.....	106.25
Christmas Con. Mines Co., Goodsprings.....	65.88
Churchill Milling Co., Wonder.....	1,666.64
Cinnabar Leasing Co., Ione.....	17.00
Clapp, E. E. (Clapp, Berryman Co.), Columbia.....	121.97
Colorado Nevada M. & M. Co., Nelson.....	285.41
Colton, Geo. R., Searchlight.....	10.69
Colton & Weidman (Duplex Mg. Co.), Searchlight.....	18.93
Combined Metals Co., Pioche.....	132.34
Commercial Mines & Mlg. Co., Manhattan.....	267.22
Como Consolidated Mines Co., Como.....	89.77
Comstock Leasing Co., Gold Hill.....	848.66
Comstock Mg. & Mlg. Co., Silver City.....	74.30
Comstock Monte Cristo Mg. Co., Virginia.....	15.29
Comstock Recovery Co., Brunswick Mill.....	4.05
Comstock Tailings Co., Morgan Mill.....	12.80
Consolidated Copper Mines Co., Kimberly.....	4,595.46
Consolidated Milling Co., Manhattan.....	105.32
Consolidated Virginia Mg. Co., Virginia.....	14.20
Copper Leaching Syndicate, Reno.....	50.12
Cyrus Noble Lease, Searchlight.....	8.60
Davenport Independent Leasing Co., Sodaville.....	7.89
Dayton Placer Recovery Co., Dayton.....	305.55
D. & C. Mining Co., Awakening.....	6.55
Delaware Mining Co., Vernon.....	45.54
Desert Power & Mill Co., Miller.....	5,362.25
Dexter White Caps Mg. Co., Manhattan.....	58.28

Forwarded..... **\$35,518.02**

Contributor and Address	Premiums
Forwarded.....	\$85,518.02
Dolbear Mining Co., Lovelock.....	2 66
Donnelly Mountain Mg. Co., Donnelly Mountain.....	7.95
Donovan, Wm., Silver City.....	446.80
Doris M. & M. Co., Pioche.....	46 20
Dupont Copper M. Co., Searchlight.....	2.03
East Comstock Reduction Co., Virginia.....	100.22
Eden, Fred, Morgan Mill.....	3.54
El Dorado Empire M. Co., Nelson.....	7.70
El Dorado Flagstaff M. & M. Co., Nelson.....	48.84
El Dorado Gold Star Mg. Co., El Dorado Canyon.....	20.80
Elko Mining Co., Jarbidge.....	72.76
Elko Prince Leasing Co., Midas.....	388.28
Elkora Mines, Jarbidge.....	2,824.43
English, W. R. & Co., Goodsprings.....	8.80
Fairview Golden Boulder Mg. Co., Fairview.....	281.94
Fairview Round Mountain Mines Co., Round Mountain.....	189 50
Fanchini, J. B., Blair.....	62.76
Fanchini, J. B., Blair.....	156.66
Farnham & Drew, Mina.....	19.48
Florence Goldfield Mg. Co., Goldfield.....	187.82
Florence Goldfield Mg. Co., Goldfield (receiver's acct.).....	42.20
Forvilly Rochester M. Co., Rochester.....	5.85
French Western Exploration & Reduction Co., Goldfield.....	3.60
Geiger, A. W., Cortez.....	72.36
Giroux Consolidated Mines Co., Kimberly.....	1,132.32
Glendale M. & M. & Power Co., Cherry Creek.....	139.72
Golconda Gold Ledge Mg. Co., Golconda.....	67.58
Golconda Nevada Mg. Co., Golconda.....	88.84
Goldbanks Quicksilver Co., Goldbanks.....	265.97
Gold Chief Mg. Co., Caliente.....	43.51
Goldfield Consolidated Mines Co., Goldfield.....	6,219.14
Goldfield Cons. Mfg. & Trans. Co., Goldfield.....	5,049.62
Gold Prince Mg. & Lsg. Co., Gold Crater.....	16.81
Goodale, David (Silver Dyke Mine), Sodaville.....	633.07
Goodale, David (Boris Mill), Sodaville.....	284.95
Goodsprings Anchor Co., Jean.....	190.77
Goodsprings Dividend Mg. Co., Goodsprings.....	25.08
Goodsprings Sampling Works, Jean.....	61.79
Groom Mine, Indian Springs.....	162.73
Hahnwald, Paul, Gold Hill.....	64.60
Hamilton & Pollard, Silver City.....	184.51
Harrison, A. D., Lexington Creek.....	6.68
Hatch Mg. Co., National.....	7.55
Hebbard, F. A., Ramsey.....	2.24
Helen Betty Mines Co., Seven Troughs.....	22.51
Henderson, Robert B., Gerlach.....	7.50
Hilltop Mfg. & Redu. Co., Hilltop.....	144 06
Hosier Mines, Goodsprings.....	54 65
Hotaling Estate Co., Dayton.....	102.78
Howard Mines Co., Goodsprings.....	18.49
Hughes, A., Construction Co., Aurora.....	1,603.37
Humboldt County Tungsten M. & M. Co., Toulon.....	457.12
Independent Tungsten Co., Ely.....	194.80
Ivanhoe Cinnabar Co., Ivanhoe.....	43.71
Jacket, Crown Point & Belcher Mines Co., Gold Hill.....	1,141.01
Johnnie M. & M. Co., Johnnie.....	10.78
Jones & Weidman, Searchlight.....	7.92
Jumbo Reduction Co., Goldfield.....	170.36
Kane, Matt I., Manhattan.....	3.30
Kearse Lease, Round Mountain.....	12.60
Kiernan, Jos. B., Telluride.....	10 19
Kimberly Cons. Mines Co., Hilltop.....	59.00
Kimobren Leasing Co., Searchlight.....	113.41
Kinkaid M. & M. Co., Virginia.....	357.29
Levy, C. M., Pioneer.....	38.06
Lincoln Hill M. & M. Co., Rochester.....	10.06
Linticum, Chas., Jarbidge.....	8.83
Lone Mountain Silver Lead Mg. Co., Elko.....	4.81
Longfellow Gold M. & M. Co., Gardnerville.....	4.17
Los Gassabo Mill Co., Round Mountain.....	96 00
Lovelock Quicksilver Mines Co., Lovelock.....	19.27
Lynn Big Six M. & M. Co., Goldville.....	82.67
MacNamara M. & M. Co., Tonopah.....	600.78
Malcolm & Madison, Rochester.....	128.72
Manhattan Big Four Mg. Co., Manhattan.....	54.62
Manhattan Mfg. & Ore Co., Manhattan.....	53.01
Manhattan Union Amal. Mines Syn., Manhattan.....	69.96
Forwarded.....	\$62,287.97

<i>Contributor and Address</i>	<i>Premiums</i>
Forwarded.....	\$62,287.97
Marion M. & M. Co., Charleston.....	6.18
Mason Valley Mines Co., Mason.....	10,595.97
Means, J. H., Jarbridge.....	8.70
Mendha Nevada Mfg. Co., Pioche.....	40.15
Mercury Mfg. Co., Ione.....	229.66
Metals Recovery Co., Dayton.....	100.00
Mexican G. & S. Mfg. Co., Virginia.....	1,469.78
Milford Mfg. & Lsg. Co., Goodsprings.....	3.14
Mina Quicksilver Co., Mina.....	92.15
Monitor Belmont Mfg. Co., Belmont.....	587.14
Montana Tonopah Mines Co., Tonopah.....	420.72
McDonald, A. M., Bullionville.....	241.57
McGinnis, R. B., Manhattan.....	1.43
McGregor & Johnston, Galena.....	63.97
McTigue, Mrs. C. M., Silver City.....	217.73
National Antimony Co., Unionville.....	241.01
National Mines Co., National.....	331.54
Nevada Austin Mines Co., Austin.....	860.84
Nevada Cinnabar Co., Ione.....	46.70
Nevada Douglas Cons. Copper Co., Ludwig.....	344.13
Nevada Hills Mfg. Co., Fairview.....	1,881.42
Nevada Humboldt Tungsten Mines Co., Mill City.....	12.00
Nevada Lime & Plaster Co., Sloan.....	266.58
Nevada Milling Co., Tonopah.....	312.44
Nevada New Mines Co., Rawhide.....	458.26
Nevada Ore and Copper Co., Acme Tanks.....	10.65
Nevada Packard Mines Co., Packard.....	1,008.40
Nevada Quicksilver Co., Mina.....	58.88
Nevada Scheelite Co., Ely.....	30.38
Nevada Securities Co., Goldfield.....	28.87
Nevada Sulphur Co., Sulphur.....	293.53
Nevada Wonder Mfg. Co., Wonder.....	498.78
Nye, Robert, Rochester.....	6.77
Olympic Mines Co., Mina.....	1,091.45
Ophir Silver Mfg. Co., Virginia.....	306.47
Orr, Mrs. Pennsylvania, Humboldt Co.,	32.79
Overland Con. Mfg. Corp., Gold Hill.....	8.80
Pacific Portland Cement Co., Mound House.....	2,526.41
Palmetto Con. Mfg. Co., Inc., Palmetto.....	4.52
Peak Mines Co., Silver Peak.....	11.93
Pepper & Keough, Mina.....	5.40
Pick & Shovel Lease, Jarbridge.....	4.82
Pine Grove, Nevada G. Mfg. Co., Pine Grove.....	36.30
Pioche Mines Co., Sauer.....	79.37
Pioneer Con. Mines Co., Pioneer.....	130.60
Pittsburg Dolores Mfg. Co., Yerington.....	807.36
Pittsburg Silver Peak G. Mfg. Co., Blair.....	2,025.71
Potosi Mfg. Co. (Empire Zinc Co.), Arden.....	293.42
Prince Con. Mfg. & Smelting Co., Pioche.....	1,037.49
Quartette Mfg. Co., Searchlight.....	178.66
Rand Mining Co., Searchlight.....	68.44
Rex Mines Co. (Liddell & Howell), Midas.....	132.02
Richmond-Eureka Mfg. Co., Eureka.....	1.78
Rives, B. A. (Trustee), Blair.....	81.50
Rochester Mines Co., Rochester.....	1,554.24
Rockland Mfg. Co., Rockland.....	28.47
Round Mountain Mfg. Co., Round Mountain.....	279.02
Roylance Reduction Co., Kennedy.....	503.53
Ruby Hill Mine, Gardnerville.....	7.33
Saint Anthony Mines Co., Toy.....	530.57
Salt Lake Tungsten Mines Co., Tungstania.....	124.97
Santa Fe Mfg. Co., Searchlight.....	2.06
Schrader, E. J., Yerington.....	14.53
Seven Troughs Coalition Mfg. Co., Seven Troughs.....	612.85
Sheba Gold & Silver Mfg. Co., Imlay.....	76.02
Silver Bow Bell Mfg. Co., Silver Bow.....	0.60
Silver Dyke Mine, Sodaville.....	184.12
Silver Hill Leasing Co., Silver City.....	45.01
Silver Mines Corp., Hornsilver.....	2,960.05
Spanish Springs Mfg. Co., Spanish Belt.....	8.61
Star Peak Mine, Humboldt.....	94.59
Stearns-Rogers Mfg. Co., Lovelock.....	531.98
Stevenson & Weber, Round Mountain.....	1.80
Sultan Mine, Goodsprings.....	238.18
Sunset Mfg. & Dev. Co., Rhyolite.....	216.81
Forwarded.....	\$99,832.52

<i>Contributor and Address</i>		<i>Premiums</i>
Forwarded.....		\$99,882.52
Techatticup, Mg. Co., Nelson.....		1,072.83
Techow, Water House Mg. Co., Virginia.....		112.01
Thorndyke-Bley Mg. Co., Sunland.....		12.53
Tilford Mine (Atkins Knoll Co.), Osceola.....		31.05
Toboguia Mg. Co., Leadville.....		196.86
Tonopah Belmont Dev. Co., Tonopah.....		4,261.80
Tonopah Extension Mg. Co., Tonopah.....		2,919.51
Tonopah Liberty Mg. Co., Tonopah.....		1.70
Tonopah Mining Co. of Nevada, Tonopah.....		1,438.86
Trimble, R. A., Dayton.....		41.13
Trimble, R. A. (Cyanide Plant), Dayton.....		3.88
Trinity Leasing Syn., Sunland.....		64.54
Tungsten Comet Mg. Co., Panaca.....		98.60
Tungstania Mg. & Mllg. Co., Tungstania.....		219.45
Union Amalgamated Mg. Co., Manhattan.....		264.21
United States Tungsten Corp., Ely.....		487.40
Walker River Copper Co., Yerington.....		347.77
War Eagle Mllg. Co., Manhattan.....		16.07
Webster Mines Corp., Grantsville.....		69.52
Weidlein, E. R., Thompson.....		747.48
West End Con. Mg. Co., Tonopah.....		2,203.71
West End Con. Mg. Co. and Cave Spring Acet., Tonopah.....		1,155.82
Western Metals Co., Lovelock.....		8.75
Western Ore Purchasing Co., Millers.....		2,847.31
Western Silica Co., Beatty.....		16.00
Wheeler Gold Mine Co., Yerington.....		4.50
Wheeler Mine Lease, Pine Grove.....		3.33
White Caps Mining Co., Manhattan.....		1,178.88
White Pine Exploration Co., Cherry Creek.....		173.30
Whytock & Sears, Suto.....		12.89
Windisch & Robohn, Silver City.....		185.08
Winnemucca Mountain Mg. Co., Winnemucca.....		487.60
Whittenburg Mill, Manhattan.....		120.32
Whittenburg, Mushett Lease, Manhattan.....		178.05
Whittenburg & Salsberry, Manhattan.....		17.53
Wood, G. W., Silver City.....		236.40
Yellow Jacket G. & S. Mg. Co., Gold Hill.....		812.44
Yellow Pine Mg. Co., Goodsprings.....		1,410.35
Yount & Fayle (Bullion Mine), Jean.....		48.98
Yuba Leasing & Dev. Co., Pioche.....		125.11
		\$122,849.97

Class 4 RAILROADS

<i>Div. Vr. No.</i>	<i>Contributor and Address</i>	<i>Premiums</i>	<i>Refund</i>
1036	Bullfrog Goldfield Ry. Co., Goldfield-Beatty.....	\$3,011.17	\$612.17
1037	Las Vegas & Tonopah Ry. Co., Beatty-Las Vegas.....	2,787.50	556.53
1038	Nevada Central R. R. Co., Battle Mountain-Austin.....	2,153.94	487.90
1039	Nevada Copper Belt R. R. Co., Mason.....	1,210.15	246.02
1040*	Nevada Interurban Ry. Co., Reno.....	131.05	26.64
1041*	Nevada Short Line R. R. Co., Oreana-Rochester.....	705.53	143.43
1042*	Nevada Transportation Co., Palisade-Eureka.....	1,669.97	339.51
1043	Pioche Pacific R. R. Co., Pioche.....	872.32	177.34
1044	Pittsburg Silver Peak R. R. Co., Blair Jc. to Blair.....	439.14	89.28
1045	Reno Traction Co., Reno.....	192.04	39.04
1046	Tonopah & Goldfield R. R. Co., Goldfield.....	18,064.03	2,655.92
1047	Tonopah & Tidewater R. R. Co.....	824.36	126.94
1048	Virginia & Truckee Ry. Co., Carson City.....	11,751.70	2,389.13
		\$38,562.90	\$7,839.85

*Debit balance to the account of contributor has been deducted from amount of refund shown.

Class 5
PUBLIC UTILITIES

<i>Div. Vr.</i> <i>No.</i>	<i>Contributor and Address</i>	<i>Premiums</i>	<i>Refund</i>
1049	Bell Telephone Co., San Francisco.....	\$328.71	\$150.43
1050	Berg, W. H., Round Mountain.....	55.50	25.40
1051	Canyon Power Co., Lahontan.....	709.34	324.62
1052	Carson City Coal Gas Co., Carson City.....	223.33	102.20
1053	Carson Water Co., Carson City.....	298.42	136.57
1054	Coachella Valley Ice & Electric Co., Rhyolite.....	470.24	215.20
1055	Cons. Power & Telephone Co., Las Vegas.....	235.14	107.61
1056	Douglas M. & P. Co., Gardnerville.....	36.67	16.78
1057	Douglas M. & P. Co., Gardnerville.....	295.18	135.09
1058	Elko Co. Tel. & Tel. Co., Elko.....	267.79	122.55
1059	Elko-Lamoille Power Co., Lamoille.....	1,726.13	789.95
1060	Elko Water & Light Corp., Elko.....	246.66	112.88
1061	Elko Water Works, Elko.....	152.34	69.72
1062	Ely Light & Power Co., Ely.....	1,207.31	552.51
1063	Ely Water Co., Ely.....	177.89	81.41
1064	Emeralda Power Co., Tonopah.....	936.86	428.75
1065	Emeralda W. & M. Co., Mina.....	50.02	27.47
1066	Eureka Water Works, Eureka.....	12.24	5.60
1067	Finch, J. W. & Co., Lovelock.....	467.71	214.04
1068	Globe Gas Co. of Nevada, Goldfield.....	53.18	24.34
1069	Golconda Tel. & Power Co., Winnemucca-Golconda.....	633.22	312.67
1070	Goldfield Con. Water Co., Goldfield.....	766.19	350.64
1071	Hawthorne Water Co., Hawthorne.....	21.51	9.84
1072	Humboldt-Lovelock Irrigation, Lt. & P. Co., Humboldt House.....	112.20	51.35
1073	Indian Springs Water Co., Rhyolite.....	72.30	33.09
1074	Lander Co. Elec. L. & P. Co., Battle Mountain.....	278.97	127.67
1075	Lander Co. Elec. L. & P. Co. & Battle Mt. Garage, Battle Mt.....	44.12	20.19
1076	Las Vegas Gas Co., Las Vegas.....	99.99	45.76
1077	Lovelock Valley Drainage District, Lovelock.....	497.87	227.85
1078	Lovelock-Woolsey L. & P. Co., Lovelock-Woolsey.....	445.88	204.05
1079	Manhattan Water Co., Manhattan.....	26.88	12.30
1080	Mason Water, Light & Power Co., Mason.....	213.00	97.48
1081	Nevada-California Power Co., Goldfield.....	4,383.77	2,006.19
1082	Nevada Con. Tel. & Tel. Co., Carson City.....	11.31	5.18
1083	Nevada Gas Co., Tonopah.....	891.70	408.08
1084	Nevada Power Co.....	34.26	15.68
1085	Nevada Tel. & Tel. Co., Tonopah.....	1,223.93	560.12
1086	Nevada Valleys Power Co., Lahontan.....	1,654.41	757.12
1087	Pacific Power Co., Bodie-Jordan, Calif.....	492.20	225.25
1088	Reno Power, Light & Water Co., Reno.....	7,774.45	3,557.90
1089	Southern Development Co., Hawthorne.....	10.32	4.72
1090	Truckee River Gen. Elec. Co., Reno.....	4,341.44	1,986.81
1091	United Farmers Tel. & Tel. Co., Gardnerville.....	345.82	158.26
1092	Virginia & Gold Hill Water Co., Virginia City.....	2,057.22	941.47
1093	Wallbrecht, H. A., Searchlight.....	30.00	13.73
1094	Western Union Telegraph Co., San Francisco.....	2,451.57	1,121.94
1095	White Pine Telephone Co., Ely.....	422.71	193.45
1096	Winnemucca Water & Light Co., Winnemucca.....	690.84	316.20
1097	Wonder Water Co., Wonder.....	219.62	100.51
1098	Yerington Electric Co., Yerington.....	228.34	104.50
		\$38,486.80	\$17,613.12

Class 6

SCHOOLS, COUNTIES, STATE, ETC.

Amounts of refunds shown hereunder have been credited to accounts of respective contributors in Class 6

<i>Contributor and Address</i>	<i>Premiums</i>	<i>Refund</i>
City of Carson, Carson City.....	\$486.46	\$58.21
City of Elko, sewer contract, Elko.....	928.95	111.16
City of Ely, Ely.....	580.11	69.42
City of Fallon, Fallon.....	628.98	75.26
City of Las Vegas, Las Vegas.....	202.41	24.22
Las Vegas Public Library and Chamber of Commerce, Las Vegas..	4.20	0.50
City of Lovelock, Lovelock.....	83.22	9.96
City of Reno, Reno.....	5,792.91	693.17
City of Sparks, Sparks.....	552.58	66.12
City of Tonopah, Tonopah.....	1,147.46	137.80
Virginia City and Town of Gold Hill, Virginia and Gold Hill.....	68.60	8.21
City of Winnemucca, Winnemucca.....	47.16	5.64
City of Yerington, Yerington.....	265.21	31.73
County of Churchill, Fallon.....	988.99	118.84
County of Clark, Las Vegas.....	385.63	40.16
Clark County Highway Commission, Las Vegas.....	558.55	66.84
County of Douglas, Minden.....	571.27	68.36
City and County of Elko, Elko.....	1,771.51	211.98
Harkins, Wm., Jarbridge.....	176.86	21.16
Weathers, W. M. (Elko County Assessor), Elko.....	12.14	1.45
*Emeralda County and Goldfield City, Goldfield.....	1,642.38	196.52
Emeralda County Highway Commission, Goldfield.....	89.02	10.65
County of Eureka, Eureka.....	281.34	33.66
County of Humboldt, Winnemucca.....	40.14	4.80
County of Humboldt and Towns of Winnemucca and Lovelock.....	2,651.97	317.33
County of Lander, Austin.....	874.07	104.59
County of Lincoln, Pioche.....	393.57	47.09
Lincoln County Highway Commission, Pioche.....	192.59	23.05
County of Lyon, Yerington.....	1,642.97	196.60
Mineral County, Hawthorne.....	1,186.87	141.96
County of Nye, Tonopah.....	1,629.27	194.96
County of Ormsby, Carson City.....	494.71	59.20
County of Storey, Virginia.....	866.35	43.84
County of Washoe, Reno.....	3,160.19	378.15
County of White Pine, Ely.....	1,623.98	194.32
*State of Nevada, Carson City.....	8,557.60	1,023.98
Department of Highways of State of Nevada, Carson City.....	106.69	12.77
Nevada Industrial Commission, Carson City.....	408.75	48.91
Nevada School of Industry, Elko.....	33.14	3.97
Nevada Sheep Commission, Reno.....	227.55	27.23
Nevada State University, Reno.....	4,887.14	584.79
State Board of Stock Commissioners, Reno.....	46.62	5.58
State Rabies Commission, Reno.....	259.63	31.07
State Library, Carson City.....	8.38	1.00
Churchill County Schools, Fallon.....	468.76	55.49
Clark County Schools, Las Vegas.....	546.62	66.41
Clark County High School, Las Vegas.....	134.85	16.14
Douglas County Schools, Gardnerville.....	189.33	22.66
Elko County Schools, Elko.....	1,529.00	182.96
*Emeralda County Schools, Goldfield.....	638.81	76.44
Eureka County Schools, Eureka.....	277.77	33.24
Humboldt County Schools, Winnemucca.....	1,066.99	127.67
Lander County Schools, Austin.....	313.07	37.46
Lincoln County Schools, Pioche.....	421.48	50.44
Lincoln County Board of Education, Panaca.....	93.05	11.14
Lincoln County High School, Panaca.....	15.08	1.80
Lyon County Schools, Yerington.....	549.11	65.71
Mineral County Schools, Hawthorne.....	247.49	29.61
Nye County Schools, Tonopah.....	1,035.39	123.89
Ormsby County Schools, Carson City.....	363.98	43.55
Storey County Schools, Virginia City.....	275.85	33.01
Washoe County Schools, Reno.....	2,116.37	253.25
White Pine County Schools, Ely.....	1,147.01	137.25
	\$57,432.58	\$6,872.33

*Debit balance to the account of contributor has been deducted from amount of refund shown.

Class 7

MISCELLANEOUS INDUSTRIES

Auto Dealers, Garages, and Auto Stages

No refund. Amounts shown represent premium payments to June 30, 1918.

<i>Contributor and Address</i>	<i>Premiums</i>
Battle Mountain Garage, Battle Mountain.....	\$35.53
Bertram, E. L., Tonopah.....	3.60
Breen, J. A., Machine Shops, Reno.....	40.19
Brown Parker Auto Co., Goldfield.....	215.68
Buick Transfer Co., Reno.....	2.70
Burkham, C. B., Bodie-Hawthorne.....	507.43
Cain, S. W., Mill City.....	9.79
Cain, S. W. & Murphy, A. A., Mill City.....	7.34
Calavada Auto Co., Reno.....	556.60
Capitol Garage & Eng. Co., Carson City.....	127.00
Clemm, Jean.....	50.80
Clemm & Nikrant, Jean.....	81.66
Conklin Bros., Las Vegas.....	163.93
Connor, Jos. E., Manhattan.....	43.65
Consolidated Auto Co., Tonopah.....	46.60
Coverston, G. C., Fallon.....	55.57
Dangberg & Larsen, Minden.....	0.99
District Auto Service, Inc., Ely.....	339.46
Elko Auto Co., Elko.....	9.10
Ely Motor Car Co., Ely.....	45.16
Eureka Garage & Supply Co., Eureka.....	17.34
Fisher, Emil, Copper Canyon.....	27.74
Gilcrease, L. L., Reno.....	147.92
Golconda-Gold Circle Auto Stage, Golconda.....	29.35
Grindling, A. C., Battle Mountain.....	10.17
Hand, W. J., Tonopah.....	212.89
Haviland, C. E., Winnemucca.....	24.50
Hughes, H. C., Yerington.....	1.55
Jones, Jesse, Jean.....	24.47
Law, B., Yerington.....	3.65
Mack Garage, Reno.....	13.31
Maclean & Doyle, Jean.....	73.32
Mina Garage, Mina.....	10.53
Moores, E. M., Mina.....	36.88
Motor Sales Co. of Nevada, Inc., Tonopah.....	45.54
Motor Service Co., Reno-Yerington.....	20.23
McAlpine, R. V., Hornsilver.....	59.18
McCutchen, V. D., Indian Springs.....	52.08
McLean, Jean.....	39.93
Nugent, Jos. F., Yerington.....	72.36
Overland Garage, Lovelock.....	149.01
Reading, G. M., Hawthorne.....	120.52
Reo Sales Co., J. C. Durham, Reno.....	119.82
Revada Sales Co., Reno.....	247.25
Schwanleck, F. W., Goodsprings.....	13.89
Searchlight Garage, Searchlight.....	178.50
Service First Garage, Ely.....	45.60
Simcox Garage, Elko.....	6.40
Simcox & Lani, Elko.....	77.28
Snyder Freight & Auto Co., Yerington.....	24.84
Starr, F. P., Battle Mountain.....	9.00
Steinheimer Bros., Reno.....	165.97
Tonopah-Manhattan Auto Co., Tonopah-Manhattan.....	153.00
Tonopah Trucking Co., Tonopah.....	42.19
Van Schoiak & Sellars, Winnemucca.....	40.18
Wadey M. Geo., Goodsprings.....	235.68
Western Auto Sales Co., Reno.....	230.01
Western Garage, Reno.....	52.71
Whyback, W. H., Lovelock.....	6.00
Woods, Louis A., Goodsprings.....	64.53
Woodward, J. W., Las Vegas.....	59.36

\$5,307.46

Brewing, Bottling, and Ice Manufacturing

Dir. V. No.	Contributor and Address	Premiums	Refund
1099	Buffalo Brewing Co., Reno.....	\$24.63	\$3.12
1100	Carson Brewing Co., Carson City.....	252.39	32.02
1101	Coddington, C. M., Yerington.....	215.72	27.37
1102	Ely Ice Manufacturing Co., Ely.....	215.68	27.36
1103	Heidtman & Co., Reno.....	59.04	7.49
1104	Nevada Distillers & Brewers Co., Fallon.....	233.30	29.60
1105	Nevada National Ice Co., Tonopah.....	43.03	5.46
1106	Nevada National Ice & C. S. Co., Tonopah.....	26.47	3.86
1107	Rainier Bottling Works, Reno.....	66.68	8.46
1108	Reno Brewing Co., Reno.....	1,812.02	229.88
1109	Seattle Brewing Co., Reno.....	39.96	5.07
1110	White Pine Soda Co., Ely.....	31.80	4.03
		\$3,020.72	\$383.22

Building-Construction and Wrecking

1111	Alston & Hoggan, Ely.....	\$74.43	\$9.44
1112	Archibold, C. H. & H. G., Gardnerville.....	22.44	2.85
1113	Bernasconi, J., Reno.....	82.29	10.44
1114	Brown, C. B. & Co., Winnemucca.....	73.78	9.36
1115	Brown, H. C. F., Ely.....	34.01	4.81
1116	Buchanan, A. A., Tonopah.....	8.20	1.04
1117	Burke Building Co., Reno.....	35.71	4.53
1118	Burrows, R. A., Reno.....	5.29	0.67
1119	Caldwell & Son, Sparks.....	447.20	56.73
1120	California Artistic Metal & Wire Co., Reno.....	24.01	3.05
1121	Campbell & Turner, Las Vegas.....	392.22	49.76
1122	Chapman, C. E., Tonopah.....	9.10	1.15
1123	Cheney, A. E., Reno.....	13.85	1.76
1124	Clock & Shea, Reno.....	13.56	1.72
1125	Clock & Son, Reno.....	20.02	2.54
1126	Davies Bros., Minden.....	86.53	10.98
1127	Dennis, John B., Reno.....	16.26	2.06
1128	Dick, Thomas, Virginia.....	74.83	9.49
1129	Doell, Carl T., Elko.....	26.71	3.39
1130	Dromiac, Alex., Reno.....	105.00	13.32
1131	Dunn, Mrs. James, Reno.....	22.28	2.83
1132	Dyer Bros., Reno.....	26.40	3.35
1133	Edwards & Wilkey Co., Las Vegas.....	295.42	37.48
1134	Electrical Construction Co., Reno.....	20.73	2.63
1135	Evans, Millie R., Lovelock.....	30.00	3.81
1136	Fenley, J. J., Tonopah.....	201.07	25.51
1137	First National Bank, Winnemucca.....	89.71	11.38
1138	Fischer, N. P., Carson City.....	6.55	0.83
1139	Forderer Cornice Works, Reno.....	10.12	1.28
1140	Fowler, E. K., Reno.....	112.01	14.21
1141	Frandsen, Andrew, Reno.....	166.45	21.12
1142	Friedhoff & Hoeffel, Winnemucca.....	429.64	54.50
1143	Fulker, W. P., & Co., Reno.....	2.58	0.33
1144	Gallagher, F. C., Dayton.....	28.57	3.62
1145	Gault, U. Co., Carson City.....	19.67	2.50
1146	Gebhardt, L. K., Tonopah.....	5.75	0.73
1147	Graff, W. L., Fernley.....	75.23	9.54
1148	Griffith, E. W., Las Vegas.....	13.25	1.68
1149	Guernsey, R. B., & Co., Reno.....	8.75	1.11
1150	Guild, Clark J., Yerington.....	30.70	3.89
1151	Harvey, A. F., Reno.....	5.55	0.70
1152	Henderson, W. D., Reno.....	58.24	7.39
1153	Henricksen, A., Fallon.....	47.36	6.01
1154	Hoffman, J. L., Gardnerville.....	149.16	18.92
1155	Horsgun, J. E., Reno.....	7.65	0.97
1156	H. W. Johns-Manville Co., Carson City.....	7.90	1.00
1157	Johnson, John, Reno.....	33.90	4.30
1158	Jones, Frank C., Gardnerville.....	61.03	7.74
1159	Kaiser, L. A., Fallon.....	20.58	2.61
1160	Kauffman, J. G., Yerington.....	26.40	3.35
1161	Klyce, H. A., San Francisco, Cal.....	14.76	1.87
1162	Koch, A. P., & Co., Sparks.....	16.00	2.03
1163	Kottke, W. F., Battle Mountain.....	14.25	1.81
1164	Kotz, H. B., Virginia City.....	118.52	15.04
		\$3,741.62	\$474.66

Forwarded.....

*Debit balance to the account of contributor has been deducted from amount of refund shown.

<i>Div. Vr. No.</i>	<i>Contributor and Address</i>	<i>Premiums</i>	<i>Refund</i>
	Forwarded.....	\$3,741.82	\$474.86
1165	Lewis, Walter O., Reno.....	87.29	8.54
1166	Low, Earl F., Las Vegas.....	17.65	2.24
1167	Maundrell, H., Reno.....	16.00	2.03
1168	Meskimmons & Foster, Reno.....	113.75	14.48
1169	Moffat, W. H. Reno.....	4.50	0.57
1170	Muller & Armstrong, Elko.....	812.08	39.59
1171	Munn, F. M., Aurora.....	29.64	3.76
1172	Musto, Joe. Sons. (Keenan Co.) Reno.....	27.02	3.48
1173	McDonald & Kahn, Reno.....	184.76	17.10
1174	McGilvray Stone Co., Reno.....	13.32	1.69
1175	McGinty, A. L., Carlin.....	420.79	53.38
1176*	McGinty, W. G. & Son, Fallon.....	31.65	4.02
1177	Nixon National Bank, Reno.....	80.36	10.19
1178	Olsen, O. J., Fernley-Yerington.....	96.34	12.22
1179	Otis Elevator Co., Reno.....	66.26	8.41
1180	Paterson, Andrew, Reno.....	87.04	11.04
1181	Peterson, H. L., Reno.....	177.39	22.50
1182	Pioneer Construction Co., Reno.....	4.32	0.55
1183	Polson, R. G., Winnemucca.....	15.29	1.94
1184	Power Plant Equipment Co., Millers.....	61.04	7.74
1185	Reinhart Co., Winnemucca.....	13.47	1.71
1186	Reno Construction Co., Reno.....	969.44	122.98
1187	Richmond Marble Co., Carson City.....	9.42	1.20
1188	Rockwell & Sutton, Elko.....	193.02	24.49
1189	Ross, C. R., Reno.....	47.70	6.05
1190	Ross, John, Yerington.....	12.76	1.62
1191	Roth, H., & Sons, Inc., Tonopah.....	81.04	10.28
1192	Roush & Bels, Reno.....	6.00	0.76
1193	Rubin Singer & Karnopsky, Delamar.....	31.76	4.03
1194	Sellman, C. G., Construction Co., Carson City-Reno.....	297.62	37.76
1195	Shea, N. P., Reno.....	2.92	0.37
1196	Shea & Bernasconi, Reno.....	30.83	3.91
1197	Smith, Joe S., Las Vegas.....	12.91	1.64
1198	Smith & Peterson, Reno.....	295.77	37.52
1199	Snook, F. W. Co., Reno.....	53.83	6.83
1200	Southwest Construction Co., Las Vegas.....	21.46	2.72
1201	Stevenson, Frank, Reno.....	58.63	7.44
1202	Sullivan, P. J., Las Vegas.....	7.80	0.99
1203	Sullivan & Dodds, Las Vegas.....	9.81	1.24
1204	Swadener, Geo., W., Las Vegas.....	99.15	12.58
1205	Swanson, J. A., Verdi.....	28.00	3.55
1206	Talbott, Mrs. J. B., Reno.....	4.38	0.56
1207	Threlkill, J. E., Reno.....	22.50	2.85
1208	Turgeon, I. A., Elko.....	33.10	4.20
1209	Wagner, Wm., Carson City.....	4.90	0.62
1210	Walker, P. J. & Co., Reno.....	73.15	9.28
1211	Ward Bros., Reno.....	1,702.05	215.92
1212	Weller, G. W., Ely.....	189.82	24.08
1213	Wiggins, A. V., Carson City.....	1.32	0.17
1214	Zabala & Co., Winnemucca.....	13.30	1.69
		\$9,845.97	\$1,249.07

Creameries and Dairies

No refund. Amounts shown represent premium payments to June 30, 1918.

Carson Creamery Co., Carson City.....	\$34.20
Chism, Jno, Reno.....	9.92
Chism Ice Cream Co., Reno.....	33.81
Churchill Creamery Co., Fallon.....	265.98
Jensen Creamery Co., Reno.....	21.01
Lamoille Creamery, Lamoille.....	50.55
Lovelock Farmers Creamery Co., Lovelock.....	50.95
Minden Butter Mfg. Co., Minden.....	446.87
Mutual Creamery Co., Reno.....	277.49
Queen Creamery, Smith Valley.....	27.10
Standard Milk Co., Reno.....	34.20
	\$1,257.08

*Debit balance to the account of contributor has been deducted from amount of refund shown.

Flour Milling

Dir. Vr. No.	Contributor and Address	Premiums	Refund
1215	Elko Milling Co., Elko.....	\$9.00	\$1.14
1216	Fallon Flour Mill Co., Fallon.....	41.27	5.24
1217	Lowell Grain & Milling Co., Elko.....	64.12	8.14
1218	Pitt, W. C., Warehouse Co., Lovelock.....	274.10	84.77
1219	Pitt, W. C., Mill & Elevator Co., Lovelock.....	172.36	21.87
1220	Reno Flour Mill, Reno.....	9.84	1.18
1221	Riverside Mill Co., Reno.....	887.05	112.53
		<hr/> \$1,467.24	<hr/> \$184.87

Highway Construction, Paving, Cement Walks, Well Drilling, Ditch Construction, and Power-Line Construction

1222	Bienfeld, Daniel L., Wellington.....	\$101.05	\$12.82
1223	Clark, T. W. Sand Springs.....	19.21	2.43
1224	Chute, G. W., Reno.....	34.11	4.33
1225	Conway, P. J., Aurora.....	34.18	4.34
1226	Crosby, Henry, Fernley.....	128.06	16.25
1227	Crosby Co., The, Virginia.....	2.45	0.31
1228	Cunningham, G. H., Reno.....	14.25	1.80
1229	Delameter, J. A., Las Vegas.....	23.58	2.99
1230	Duncan, F. M., Reno.....	20.89	2.65
1231	Egger, J. A., Goodsprings.....	3.60	0.46
1232	Elko Dev. Co., Elko.....	81.00	10.23
1233	Fitzgerald Steam Shovel Co., Wellington.....	101.49	12.88
1234	Ingram, J. H., Austin.....	4.08	0.52
1235	Jarbridge Commercial Club, Jarbridge.....	60.00	7.61
1236	Jordon, F. R., Lovelock.....	5.01	0.64
1237*	Kibby, M. A., Goldfield.....	20.39	2.59
1238	Meller, Louis J., Aurora.....	3.97	0.50
1239	McDonald, J. W., & Co., Reno.....	248.02	31.46
1240	Negal & Sandry, Mason.....	6.75	0.86
1241	Neilson, W. L., Ely.....	14.01	1.78
1242	Railroad Valley Co., Tonopah.....	148.16	18.80
1243	Richards, E. R., Yerington.....	105.52	13.39
1244	Robertson & Fauerby, Manhattan.....	19.37	2.46
1245	Smith, B. H., Panaca.....	85.09	10.79
1246	Smith, B. H., Tonopah.....	32.72	4.15
1247*	Smith & Spragins, Halleck.....	99.59	12.63
1248	Somers & Wilson, Goldfield.....	11.15	1.41
1249	Sotiras, Chas. D., Bishop.....	22.05	2.80
1250	Webster, W. J., Lemmon Valley.....	11.31	1.43
1251	Wikoff, C. N., Battle Mountain.....	125.64	15.93
		<hr/> \$1,586.70	<hr/> \$201.29

Hotels, Restaurants, and Saloons

1252	Ahern, Con., Virginia.....	\$18.40	\$1.70
1253	Allen Hotel, Wells.....	9.60	1.22
1254	Arnberg, Oscar, Virginia.....	3.00	0.33
1255	Ambrose & O'Neil, Goldfield.....	1.80	0.23
1256	Anderson, H., Gardnerville.....	1.69	0.21
1257	Apex Saloon, Ely.....	19.50	2.47
1258	Arden, Phil., Reno.....	3.24	0.41
1259	Arizona Club, Las Vegas.....	15.90	2.02
1260	Arlington Hotel, Carson City.....	278.46	35.33
1261	Arnold, B. L., Elko.....	10.31	1.31
1262	Avanzine, John, Goldfield.....	24.75	3.14
1263	Barber & Montgomery, McDermitt.....	18.69	2.37
1264	Baker, B. F., Mina.....	337.09	42.76
1265	Barker, T. T., Verdi.....	2.10	0.27
1266	Baskett, Fay, Goldfield.....	3.60	0.46
		<hr/> \$748.13	<hr/> \$94.28

Forwarded.....

*Debit balance to the account of contributor has been deducted from amount of refund shown.

Dis. Vr. No.	Contributor and Address	Premiums	Refund
	Forwarded.....	\$748.18	\$94.28
1267	Bernard, V. C., Yerington.....	9.80	1.24
1268	Big Meadows Hotel, Lovelock.....	17.67	2.24
1269	Big Meadows Investment Co., Lovelock.....	155.59	19.74
1270	Blume, Phil., Winnemucca.....	13.94	1.77
1271	Bonanza Hotel Co., Goldfield.....	348.80	48.61
1272	Bright, W. C., Goldfield.....	3.44	0.44
1278	Bristol Boarding House, Bristol.....	6.81	0.86
1274	Bud Saloon, Ely.....	11.65	1.48
1275	Buralla, Joe, Dayton.....	11.81	1.50
1276	Burns, J., Wonder.....	1.14	0.14
1277	Butilla, S., Wabuska.....	0.54	0.07
1278	Calahan & Hammond, Goldfield.....	1.75	0.22
1279	Caldin, D. W., Carlin.....	12.00	1.52
1280	Callahan, Dan, Fallon.....	7.80	0.99
1281	Cameron, Alex, Yerington.....	9.30	1.18
1282	Capitol Saloon, Ely.....	9.75	1.24
1283	Case Cafe, Ely.....	4.80	0.61
1284	Central Hotel, Manhattan.....	13.90	1.76
1285	Chung Ong, Pioche.....	9.00	0.38
1286	Clark, J. N., Tonopah.....	21.32	2.70
1287	Coe, E. L., Verdi.....	8.05	0.39
1288	Colonial Hotel Co., Reno.....	73.90	9.38
1289	Commercial Hotel, Elko.....	12.64	1.60
1290	Conlin, E. E., Ely.....	10.80	1.37
1291	Copper Club Co., McGill.....	48.42	6.14
1292	Cordano, D., Winnemucca.....	8.90	1.13
1293	Currey, Jos., Elko.....	13.40	1.70
1294	Dangberg & Zorn, Minden.....	6.21	0.79
1295	Davis, H. K. (St. Elmo Saloon), Winnemucca.....	7.95	1.01
1296	Davis & McKenna, Carlin.....	2.40	0.30
1297	Dettling, J. A., Gardnerville.....	27.30	3.46
1298	Donnelly, Jno. C. Co., Aurora.....	3.60	0.46
1299	Drysdale, W. J., Tonopah.....	19.80	2.51
1300	Drysdale, W. J., Tonopah.....	17.68	2.24
1301	Easton, William, Austin.....	11.40	1.45
1302	Edwards, W. M., Mason.....	9.09	1.15
1303	Elk Saloon, Elko.....	11.53	1.50
1304	Evans, C. R., Goldfield.....	28.50	3.62
1305	Fayant, J. B., Golconda.....	29.82	3.78
1306	Fayle, Geo. A., Goodsprings.....	489.98	62.16
1307	Fayle, Geo. A., Jean.....	532.82	67.59
1308	Feeney, J. M., Wabuska.....	84.65	10.74
1309	Field, Jean, Elko.....	5.96	0.76
1310	Flurshutz, G. M., Wadsworth.....	8.60	0.46
1311	Frank Bros. Co., Reno.....	486.55	55.38
1312	Fukushima, Ben, Yerington.....	9.56	1.21
1313	Furtsch, Carl, Tonopah.....	14.25	1.81
1314	Gallery, Frank, Reno.....	2.87	0.36
1315	Garties & Garties, Winnemucca.....	94.35	11.97
1316	Gates, J. H., Winnemucca.....	7.64	0.96
1317	Gibson Apartments, Reno.....	2.27	0.29
1318	Ginsti & Fall, Tonopah.....	1.35	0.17
1319	Glavis, Joe, Virginia.....	2.63	0.33
1320	Glenbrook Improvement Co., Glenbrook.....	114.52	14.53
1321	Golden West Hotel, Carson City.....	5.22	0.66
1322	Goldfield Hotel Co., Goldfield.....	150.84	19.14
1323	Gong Low, Hawthorne.....	1.20	0.15
1324	Gooden & Clark, Elko.....	11.58	1.47
1325	Grant, J. P., Aurora.....	3.32	0.42
1326	Golconda Hot Springs, Golconda.....	20.80	2.58
1327	Hall Liquor Co., Inc., Tonopah.....	397.88	50.48
1328	Heidenreich, T. J., Carson City.....	3.00	0.38
1329	Hermitage, The, Goldfield.....	29.36	3.72
1330	Hill, M. F., Goldfield.....	6.17	0.78
1331	Hoover, C. M., Fallon.....	53.72	6.81
1332	Hotel Brown, Eureka.....	5.10	0.65
1333	Hotel McKissick, Reno.....	75.92	9.63
1334	Hotel Wallstab, Sparks.....	63.37	8.04
1335	*Ideal Cafe, Goldfield.....	15.78	2.00
1336	Ideal Restaurant, Goldfield.....	5.31	0.67
1337	Ingalls, O. D., Hawthorne.....	2.74	0.35
1338	Inman, F. W., Hazen.....	53.31	6.76
1339	Isola, Joe, Carlin.....	5.55	0.70
1340	Jackowatz, J. J., Goldfield.....	1.86	0.24
1341	Jeffrey, J. E., Fallon.....	9.11	1.16
1342	Johnson, N. C., Wabuska.....	5.15	0.65
1343	Johnson, S. S., Reno.....	10.70	1.36
1344	Johnson & Becker, Winnemucca.....	111.84	14.19
	Forwarded.....	\$4,600.86	\$583.66

*Debit balance to the account of contributor has been deducted from amount of refund shown.

Div. Vr. No.	Contributor and Address	Premiums	Refund
	Forwarded.....	\$4,600.86	\$583.66
1345	Kane's Cafe, Reno.....	25.40	3.22
1346	Kelly Bros., Tonopah.....	6.00	0.76
1347	Kline, I., Reno.....	14.60	1.85
1348	Lambert, A., Las Vegas.....	11.02	1.40
1349	Lashbaugh & Lamberson, Yerington.....	31.33	3.97
1350	Lerned, F. K., Hilltop.....	0.33	0.04
1351	Lewis, G., Fallon.....	4.52	0.57
1352	Lincoln Apartments, Reno.....	12.06	1.53
1353	Linebarger, W. J., Carlin.....	21.70	2.75
1354	Little, L., Schurz.....	33.30	4.22
1355	Louvre Saloon, Elko.....	2.85	0.36
1356	Lusich, Nick, Reno.....	29.80	3.78
1357	Lynch & Hart, Reno.....	8.21	1.04
1358	Lyric Restaurant, Goldfield.....	7.00	0.89
1359	Malley & Walsh, Tonopah.....	10.20	1.29
1360	Manion, J. H. & Co., Elko.....	15.65	1.99
1361	Mantel, A., Goldfield.....	12.05	1.53
1362	Maroney & Katzen, Goldfield.....	7.20	0.91
1363	Martin, R. H., Goldfield.....	16.65	2.11
1364	Matzdorf, F. E., Las Vegas.....	5.75	0.73
1365	Mayer Hotel Co., Elko.....	19.13	2.43
1366	Meyer, Chas., Reno.....	12.94	1.64
1367	Midland Trail Cafe, Ely.....	1.44	0.18
1368	Midway Boarding House, Tonopah.....	2.85	0.36
1369	Millisch, Steve, Reno.....	49.95	6.34
1370	Mineral Cafe, Reno.....	357.42	45.34
1371	Mineral Exchange Club and Cafe, Mina.....	5.55	0.70
1372	Mixpah Grill, Tonopah.....	209.00	26.51
1373	Mixpah Hotel Co., Tonopah.....	235.65	29.89
1374	Moller, F. A., Ely.....	15.25	1.93
1375	(Mozart) M. Durand, Goldfield.....	6.19	0.79
1376	McKenzie, D. W., Yerington.....	4.14	0.53
1377	McNeil, T. A., Wonder.....	3.86	0.49
1378	McTaggart, W. E., Yerington.....	4.39	0.56
1379	Northern Hotel Co., Ely.....	319.98	40.59
1380	Northern Hotel Co., Ely.....	30.90	3.92
1381	O'Connor & Bony, Verdi.....	8.00	0.38
1382	Olsen, Hans, Caliente.....	20.38	2.59
1383	Overland Hotel, Reno.....	256.80	32.51
1384	Palace Dance Hall, Goldfield.....	31.20	3.96
1385	Place Hotel, Hazen.....	66.70	8.46
1386	Petrini, Sibaldi & Co., Round Mountain.....	0.80	0.10
1387	Pledge, T. B., Luning.....	111.11	14.10
1388	Pollard, M., Las Vegas.....	13.00	1.65
1389	Pucinelli & Fratine, Elko.....	2.25	0.29
1390	Randolph, J., Lovelock.....	13.65	1.73
1391	Ranson, J. P. (Steptoe Cafe), McGill.....	9.16	1.16
1392	Reading Bros., Wellington.....	88.36	11.21
1393	Reno Securities Co., Reno.....	689.56	87.48
1394	Reno Wholesale Liquor Co., Reno.....	34.83	4.42
1395	Reudy, Jake, Sodaville.....	9.50	1.21
1396	Ritchford, Wm., Gardnerville.....	66.31	8.41
1397	Riverside Hotel Co., Inc., Reno.....	870.46	110.43
1398	Robinson & Co., Goodsprings.....	8.60	0.46
1399	Robinson & Ouderkirk, Elko.....	12.60	1.60
1400	Rochon, Joseph, Carson City.....	63.25	8.02
1401	Rogers & Laly, Aurora.....	2.40	0.30
1402	Rohbeck, P. H., Gardnerville.....	33.87	4.30
1403	Roletto, G., Tonopah.....	0.81	0.10
1404	Rosachi, F., Yerington.....	3.00	0.38
1405	Rosengren, C. L., Reno.....	10.82	1.37
1406	Roundtree & Co., Elko.....	16.42	2.08
1407	Sam, Charley, Virginia.....	4.83	0.61
1408	Samuelson, J. A., Goldfield.....	4.32	0.55
1409	Schaeffer, R. H., Las Vegas.....	3.74	0.47
1410	Schaeffer & Bros., Goodsprings.....	4.30	0.55
1411	Schrank, Miss E., Virginia.....	4.43	0.56
1412	Sherkey, Joe, Goldfield.....	2.70	0.34
1413	Sherman, Mrs. A. C., Fallon.....	74.24	9.42
1414	Shinn, O. S., Goodsprings.....	40.99	5.20
1415	Simon, P. A., Mina.....	106.00	13.45
1416	Slutter, J. F., Rawhide.....	1.55	0.20
1417	Smith, E. M., Wonder.....	89.87	11.40
1418	Smith, James, Fallon.....	9.00	1.14
1419	Southern Club, Ely.....	10.65	1.35
	Forwarded.....	\$8,945.08	\$1,134.74

<i>Div. Vr. No.</i>	<i>Contributor and Address</i>	<i>Premiums</i>	<i>Refund</i>
	Forwarded	\$8,945.08	\$1,134.74
1420	Stacy & Pine, Rawhide	5.98	0.76
1421	Starke, W. H., Gardnerville	11.76	1.49
1422	Steele, John H., Reno	22.98	2.92
1423	Stout, C. A., Reno	14.40	1.83
1424	Sullivan, J. H., Reno	4.80	0.55
1425	Tabor, John, Round Mountain	57.80	7.83
1426	Tabor & Leary, Round Mountain	5.27	0.67
1427	Talbott, J. E., Ely	18.00	2.28
1428	Tavern Liquor Co., Reno	11.70	1.48
1429	Taylor, W. A., Goodsprings	10.80	1.37
1430	Taylor & Moody, Tonopah	8.60	0.46
1431	Thackery, Al., Tonopah	26.66	3.38
1432	Todd, Andrew, Carson City	3.08	0.39
1433	Turner, R. E., Round Mountain	8.69	0.47
1434	Tuttle, W. H., Reno	40.64	5.16
1435	Verdi Hotel, Verdi	17.10	2.17
1436	Vetter, E. L., Ely	4.15	0.53
1437	Vunkasinovich & Brown, Tonopah	1.85	0.17
1438	Waldorf Cafe, Reno	19.55	2.48
1439	Wallace, F., Hawthorne	4.51	0.57
1440	Westcott & Pearce, Winnemucca	3.00	0.88
1441	Whitburn, F. W., Round Mountain	4.10	0.52
1442	Yanner & Gilpin, Reno	3.48	0.45
1443	Yee, Frank, Lovelock	7.80	0.99
1444	Yount & Fayle, Goodsprings	79.80	10.07
1445	Yount & Fayle, Jean	105.52	13.39
1446	Zenkhusen & Carpenter, Goldfield	1.49	0.20
		\$9,437.09	\$1,197.20
	Laundries		
1447	Economy Laundry Co., Reno	\$224.72	\$28.51
1448	Goodsprings Steam Laundry, Goodsprings	3.08	0.39
1449	Lace House French Laundry, Sparks	166.54	21.13
1450	Lovelock French Laundry, Lovelock	9.00	1.14
1451	New Troy Laundry, Goldfield	102.49	13.00
1452	Reno Steam Laundry Co., Reno	1,792.17	227.36
1453	State Laundry, Reno	71.88	9.12
1454	Troy Laundry Co., Reno	1,901.08	241.17
1455	Troy Laundry Co., Elko	37.99	4.82
1456	Troy Power Laundry, Ely	1,206.26	153.03
1457	Troy Steam Laundry, Las Vegas	649.38	82.38
1458	Yokohama Laundry, Sparks	165.73	21.02
		\$6,330.32	\$803.07

Logging, Lumbering, Etc.

No refund. Amounts shown represent premium payments to June 30, 1918.

<i>Contributor and Address</i>	<i>Premiums</i>
Boyington Bros., Verdi	\$64.49
Bruhus, A. C., Verdi	1,420.59
Clio Lumber Co., Reno	1,148.36
Dillon, James, Ely	57.43
Ely, Lumber & Coal Co., Ely	545.89
Erickson, E., Verdi	1,714.26
Goodwin, J. D., Povelok	45.71
Mason Lumber & Coal Co., Mason	142.25
Nevada Planing Mill, Reno	10.47
Pierson Mill & Lumber Co., Reno	1,420.50
Sierra Nevada Wood & Lumber Co., Carson City	466.75
Sierra Nevada Wood & Lumber Co., Lovelock	342.49
Sierra Nevada Wood & Lumber Co., Reno	1,162.58
Union Lumber Co., Reno	14.40
Union Mill & Lumber Co., Reno	548.63
Verdi Lumber Co., Verdi	23,262.68
Virginia Lumber Co., Virginia City	96.76
Von Tobel Lumber Co., Ed., Las Vegas	177.23

\$32,640.97

Machine Shops, Millwrights, and Miscellaneous Manufacturing

Dir. Vr. No.	Contributor and Address	Premiums	Refund
1469	Allis-Chalmers Mfg. Co., Milwaukee, Wis.	\$18.02	\$2.29
1460	Armstrong Mfg. Co., Reno.	273.90	34.75
1461	Bragg Machine Co., Goldfield.	69.90	8.87
1462	Campbell & Kelly, Tonopah.	2,982.81	378.40
1463	Carson Brick and Tile Co., Carson City.	25.03	3.18
1464	Carson Valley Cement and Tile Company, Carson City.	8.97	1.14
1465	Commercial Soap Co., Reno.	252.56	32.04
1466	High Street Rock Crushing Co., Reno.	2.22	0.28
1467	Nevada Engineering Works, Reno and Goldfield.	505.42	64.12
1468	Nevada Machinery and Electric Co., Reno.	178.24	22.61
1469	Nevada Sheet Metal Works, Inc., Reno.	62.00	7.86
1470	Nordberg Mfg. Co., Milwaukee, Wis.	10.00	1.27
1471	Reno Press Brick Co., Reno.	727.06	92.28
		\$5,116.13	\$649.04

Packing-Houses

No refund. Amounts shown represent premium payments to June 30, 1918.

Ely Packing Co., Ely.	\$135.76
Fallon Slaughtering Co., Fallon.	46.90
Humphrey Supply Co., Reno.	1,391.82
Nevada Packing Co., Reno.	6,541.12
Tonopah & Goldfield Meat Co., Goldfield.	621.53
United Cattle & Packing Co., Goldfield.	207.18
	\$8,944.31

Printing

1472* Appeal, Carson (Nevada Printing Co.), Carson City.	\$6.10	\$0.77
1473 Cartale, A. & Co., of Nevada, Reno.	52.77	6.69
1474* Carson City News, Carson City.	85.89	10.90
1475 Churchill County Eagle, Fallon.	5.85	0.68
1476 Elko Independent, Elko.	16.41	2.08
1477 Expositor Ptg. & Pub. Co., Ely.	63.54	8.06
1478 Green, Stalnaker & Lake, Reno.	64.08	3.13
1479 Humboldt Star, The, Winnemucca.	83.69	10.62
1480 Las Vegas Age, Las Vegas.	1.98	0.25
1481 Lovelock Pub. Co., Lovelock.	192.90	24.47
1482 Mason Valley News, Yerington.	1.08	0.13
1483 Nevada Press Co., Reno.	532.80	67.59
1484 Pioche Record Pub. Co., Pioche.	3.58	0.45
1485 Reese River Reveille, Austin.	46.09	5.85
1486 Reno Evening Gazette Pub. Co., Reno.	757.11	96.05
1487 Reno Printing Co., Reno.	38.75	4.92
1488 Schwalenberg, L. G., Ely.	30.82	3.91
1489 Tribune Ptg. Co., Goldfield.	573.19	72.72
1490 Virginia City Chronicle Pub. Co., Virginia.	96.94	12.30
1491 White Co., The, Reno.	53.67	6.81
1492 White Pine News, Ely.	108.41	13.75
1493* Yerington Times, Yerington.	4.86	0.62
	\$2,820.01	\$357.75

Railroad Construction

1494 Boyle, J. P., Reno.	\$690.76	\$87.63
1495 Carmichael, M. G., Reno.	546.57	69.34
1496 Curran, F. E., Gold Hill.	55.45	7.03
1497 Deuprey & Hillyer, Rochester.	56.65	7.19
1498 Houghton Construction Co., Lincoln.	875.47	111.06
1499 Hunt Construction Co., Chilcote, Calif.	663.58	84.18
1500 Midland Bridge Co., St. Thomas.	39.63	5.03
1501 Palmer, McBride & Quay, San Francisco, Calif.	581.17	73.73
1502 Utah Construction Co., Chilcote, Calif.	4,189.78	531.52
	\$7,699.01	\$976.71

*Debit balance to the account of contributor has been deducted from amount of refund shown.

Sugar Manufacturing

No refund. Amounts shown represent premium payments to June 30, 1918.

<i>Contributor and Address</i>	<i>Premiums</i>
Nevada Sugar Co., Fallon.....	\$307.15
Nevada-Utah Sugar Co., Fallon.....	680.59

Teaming \$987.74

No refund. Amounts shown represent premium payments to June 30, 1918.

Annet, Alfred, Sodaville.....	\$47.52
Austin, Geo. B., Junco.....	4.05
Ball, C. P., Las Vegas.....	59.32
Bath, H. J. & E. H., Carson City.....	31.92
Benadaum, C. L., Fallon.....	93.48
Berg, W. H., Round Mountain.....	6.64
Blaker, C. E., Manhattan.....	24.90
Buick Transfer Co., Reno.....	1.35
Cashman Co., Las Vegas.....	84.38
Clark Forwarding Co., Las Vegas.....	15.60
Clemons, J. C., Mina.....	2.30
Coburn, E. M., Sodaville.....	7.20
Culverwell, Bros., Pioche.....	14.93
Curran, F. E., Goldfield.....	1.85
Davison, R. P., Copper Canyon.....	12.48
Davis, D. D., Virginia and Dayton.....	289.25
Doyle, W. M., Battle Mountain.....	43.34
Eagle Transfer, Reno.....	0.99
Elko-Tuscarora Stage Line, Elko.....	260.75
Enkhause, J. B., Rochester.....	11.01
Fery Transfer, Goldfield.....	20.78
Ferry, Chas. H., Goldfield.....	157.67
Francis, W. G., Austin.....	168.11
Fredians, A., Luning.....	22.50
Horschman, R. E., Reno.....	9.89
Indermuhl, Adolph, Silver City.....	64.00
Krehmke & Machabee, Sparks.....	55.82
Kreps, W. W., Rochester.....	32.01
Leak, E. C., McGill.....	20.00
Manhattan Trading & Transfer Company, Manhattan.....	71.89
Nevada Transfer Co., Reno.....	784.73
Overland Livery, Reno.....	29.92
Paulson & Stewart, Rochester.....	54.91
Pioneer Livery, Tonopah.....	1.08
Reno Ice Delivery Co., Reno.....	531.97
Sales & McGowan, Mason.....	25.14
Shepard, J. C., Luning.....	4.40
Stephenson, M. S., Rawhide.....	93.28
Stephenson, Shepard & Wade, Fallon.....	16.63
Stewart, J. W. & Co., Tonopah.....	55.88
Tedford, J. N., Fallon.....	1,130.68
Thomas, J. H., Manhattan.....	6.37
Tonopah Oil Co., Tonopah.....	6.60
Tonopah Trade and Transfer Co., Tonopah.....	24.00
Turner, L. J., Goodsprings.....	42.45
Twaddle, E., Reno.....	38.42
Union Drayage Co., Goldfield.....	69.34
Walker Transfer Co., Tonopah.....	211.04
Wilkes Warehouse Co., Tonopah.....	39.14
Wilson, James, Jean.....	94.87
Wittenberg Warehouse & Transfer Co., Tonopah.....	1,809.76

\$6,656.54

All Others—Mercantile, Warehouses, Theaters, Office Buildings, Etc.

<i>Div.Vr.</i>	<i>No.</i>	<i>Contributor and Address</i>	<i>Premiums</i>	<i>Refund</i>
	1503	Abbey, F. T., Hazen.....	\$0.56	\$0.07
	1504	Adams, J. N., Company, Luning.....	3.00	0.38
	1505	Adams & Miller, Hawthorne.....	374.68	47.53
	1506	Addenbrook, B. R., Reno.....	9.48	1.20
	1507	Agency Bank of California, Virginia.....	8.25	1.05
	1508	Andreucetti, P., Reno.....	312.29	39.62
	1509	Associated Oil Company of Nevada, Reno.....	142.95	18.13
	1510	Athens Mercantile Company, Ely.....	12.00	1.52
	1511	Austin Commercial Company, Austin.....	64.54	8.19
	1512	Bacon, E. L., Reno.....	330.02	41.87
	1513	Badt, M. & Co., Wells.....	96.47	12.24
	1514	Baker, F. M., Carson City.....	11.12	1.41

Forwarded..... \$1,365.36 \$173.21

Dis. Vr. No.	Contributor and Address	Premiums	Refund
	Forwarded.....	\$1,365.86	\$173.21
1515	Baker, F. E., Co., Rochester.....	46.70	5.92
1516	Ballantyne, W., Goldfield.....	11.25	1.43
1517	Bank of Pioche, Pioche.....	17.85	2.26
1518	Bank of Sparks, Sparks.....	56.43	7.16
1519	Barkley, Eli, Carson City.....	1.00	0.13
1520	Barlow, B. I., Goldfield.....	8.20	1.04
1521	Barlow, B. I., Columbia.....	2.25	0.29
1522	Bartoo, A. E., Battle Mountain.....	10.85	1.38
1523	Becker Brewing Company, Elko.....	70.42	8.93
1524	Becker Brewing & Malting Company, Ely.....	157.58	19.99
1525	Beckley, Will, Las Vegas.....	13.69	1.74
1526	Beeler, E. L., Reno.....	6.92	0.88
1527	Bello, J. M. & Co., Reno.....	32.70	4.15
1528	Beowawe Mercantile Company, Beowawe.....	328.79	41.71
1529	Berg Brothers, Round Mountain.....	8.52	1.08
1530	Berquist, C., Reno.....	2.63	0.33
1531	Bible, J. H., Lovelock.....	42.97	5.45
1532	Bissinger & Co., Reno.....	\$46.86	44.00
1533	Blundell, T. H., Wadsworth.....	27.90	3.54
1534	Boerlin, Henry, Aurora.....	105.84	13.43
1535	Boggs Brothers, Las Vegas.....	109.00	13.83
1536	Books & Butler, Reno.....	11.41	1.45
1537	Bradley, J. R. & Co., Reno.....	381.55	48.40
1538	Braun, C. C., Dayton.....	10.66	1.35
1539	Brown, C. B., Reno.....	23.59	2.99
1540	Burley & Woodward, Goldfield.....	4.50	0.57
1541	Burlington, E. & Co., Carson City.....	3.15	0.40
1542	Burner, F. M., Yerington.....	0.60	0.08
1543	Burton, A. C., Fallon.....	55.34	7.02
1544	Cain, D. V., Aurora.....	29.30	3.72
1545	Caliente Merc. Co., Caliente.....	72.55	9.20
1546	Campbell, Frank, Reno.....	87.22	11.06
1547	Campbell Furniture Co., Reno.....	50.75	6.44
1548	Campton Mercantile Co., Ely.....	118.46	15.03
1549	Cann Drug Co., Reno.....	18.25	2.32
1550	Cannon Sisters, Goldfield.....	1.50	0.19
1551	Canton, D. A., Reno.....	2.47	0.31
1552	Cerrutze, B., Tonopah.....	1.80	0.23
1553	Charetti, D. & Co., Goldfield.....	7.00	0.89
1554	Cheatham, T. R., Reno.....	61.58	7.81
1555	Chiatovich & Teckla, Tonopah.....	0.90	0.11
1556	Chivers, Joe, Jean.....	31.20	3.96
1557	Churchill County Bank, Fallon.....	92.59	11.75
1558	City Market, Ely.....	40.99	5.20
1559	City Market, Reno.....	8.25	1.05
1560	Cloke, J., Tonopah.....	62.70	7.95
1561	Clay Peters Building Co., Reno.....	13.47	1.71
1562	Coffin & Larcombe, Reno.....	72.48	9.19
1563	Colbrandt & Reilly, Reno.....	4.86	0.62
1564	Collins, M. T., Ely and East Ely.....	865.07	109.74
1565	Commercial Hardware Co., Reno.....	134.00	17.00
1566	Conant Brothers, Reno.....	13.77	1.75
1567	Con. Coppermines Co., Hotel and Store, Kimberly.....	37.60	4.77
1568	Cook, John S. & Co., Goldfield.....	174.23	22.10
1569	Copley, George H., Imlay.....	60.40	7.66
1570	Cotton-Turner Cigar Co., Reno.....	5.35	0.68
1571	Crampton & Crampton, Goodsprings.....	1.80	0.23
1572	Cremner & Erickson, & Co., Goldfield.....	325.99	41.36
1573	Cuddy & Trabert, Tonopah.....	18.00	2.28
1574	Cullyford & Drabnick, Goldfield.....	3.60	0.46
1575	Culverwell, Charles, Pioche.....	2.70	0.34
1576	Cutts, C. F., Carson City.....	30.30	3.84
1577	Dale Brothers, Inc., Millers.....	65.90	8.86
1578	Dale, C. C. & Co., Tonopah.....	116.46	14.77
1579	Dalton & Clifford, Austin.....	1.25	0.16
1580	Dalton, Clifford & Wilson, Reno.....	6.66	0.84
1581	Daniel, James, Reno.....	8.70	1.10
1582	Darby Produce Co., Goldfield.....	3.60	0.46
1583	Darby Produce Co., Tonopah.....	4.22	0.54
1584	Dillon & West, Yerington.....	12.00	1.52
1585	Dobson Brothers, Las Vegas.....	10.05	1.27
1586	Donnels & Steinmetz, Reno.....	420.88	53.89
1587	Downer Brothers, Goldfield.....	48.51	6.15
1588	Drappo, E. L., Reno.....	144.19	18.29
1589	Dwyer, E. J. & Co., Virginia.....	22.78	2.89
1590	Eagle Market, Carson City.....	9.30	1.18
1591	Eclipse Decorating Co., Reno.....	7.14	0.91
1592	Elsworth, C. H., Goldfield.....	35.04	4.45
1593	Elwell, W. H., Las Vegas.....	34.60	4.39
1594	Ely National Bank, Ely.....	87.30	11.08
1595	Ely Plumbing Co., Ely.....	32.66	4.14
1596	Emporium, The, Carson City.....	64.20	8.14
1597	Epstine, H. E., Tonopah.....	2.55	0.32
	Forwarded.....	\$6,853.63	\$869.44

*Debit balance to the account of contributor has been deducted from amount of refund shown.

Div. Yr. No.	Contributor and Address	Premiums	Refund
	Forwarded.....	\$6,853.63	\$869.44
1598	Fallon Electric R. R. Co., Fallon.....	3.71	0.47
1599	Fallon Hardware Co., Fallon.....	7.50	0.95
1600	Fashion, The, Reno.....	1.07	0.14
1601	Fellis, P. & G., Goldfield.....	1.36	0.17
1602	Ferguson, A. A., Manhattan.....	2.16	0.27
1603	Fields, B. W., Goldfield.....	1.20	0.15
1604	First National Bank, Ely.....	15.98	2.03
1605	First National Bank, Lovelock.....	13.03	1.65
1606	First State Bank, Las Vegas.....	4.86	0.62
1607	Flanigan Warehouse Co., Reno.....	147.63	18.73
1608	Flett, William, Reno.....	6.64	0.84
1609	Fourth-Street Dept. Store (A. W. Plummer), Reno.....	35.58	4.51
1610	Frazzini, E. D., Yerington.....	0.92	0.12
1611	Fredericks, Jos., Virginia.....	18.90	2.40
1612	Frediana, A., Luning.....	43.45	5.51
1613	Friedman's Dept. Store, Goldfield.....	72.09	9.15
1614	Gallagher, J. C., Yerington.....	12.18	1.55
1615	Gallagher, J. H., Ely.....	104.08	13.20
1616	Goldberg & Staunton, Winnemucca.....	7.19	0.91
1617	Golden Jewelry Co., Carson City.....	2.35	0.30
1618	Golden Rule, Fallon.....	5.33	0.68
1619	Golden Rule Co., Lovelock.....	2.17	0.28
1620	Golden Rule Mercantile Co., Elko and Winnemucca.....	122.02	15.43
1621	Golden State Bakery, Reno.....	31.64	4.01
1622	Goldfield Con. Mines, Merc. Dept., Goldfield.....	195.83	24.85
1623	Goldfield Grocery, Goldfield.....	0.89	0.11
1624	Graham, W. B., Ely.....	55.00	6.98
1625	Greaves & Eggertsen, Las Vegas.....	18.33	2.33
1626	Griswold, E., Wadsworth.....	50.06	6.35
1627	Grob & Bingham, Fallon.....	7.50	0.95
1628	Grosbeck & O'Brien Co., Reno.....	148.29	18.81
1629	Hall, N. L., Las Vegas.....	33.50	4.25
1630	Hall & Morgan, Thompson.....	5.48	0.70
1631	Hamp-Thomas Company, Reno.....	10.43	1.32
1632	Hancock, W. A., Virginia.....	13.85	1.76
1633	Hatch, E. V., Goldfield.....	160.07	20.31
1634	Hawkins, W. E., Las Vegas.....	15.94	2.02
1635	Hodgkinson, S. J., Reno.....	30.20	3.83
1636	Hodgkinson Pharmacy, Reno.....	4.50	0.57
1637	Holt Manufacturing Co., Stockton, Cal.....	6.94	0.88
1638	Horton Mercantile Co., Battle Mountain.....	23.35	3.80
1639	Howard Brothers, Gardnerville.....	3.69	0.47
1640	Humboldt Mercantile Co., Inlay.....	52.66	6.68
1641	Hunting, Geo. P., Rev., Reno.....	30.76	3.90
1642	Imelli, S. A., Gardnerville.....	33.41	4.24
1643	James, A. G., Sparks.....	0.60	0.08
1644	Jensen, C. P., Goldfield.....	5.31	0.67
1645	Jensen, Arendt Co., Gardnerville.....	153.34	20.09
1646	Jones, W., Virginia.....	36.50	4.63
1647	Jones & McCall Co., Fallon.....	15.21	1.93
1648	Johnson, Wes., & Co., Elko.....	5.80	0.74
1649	Kaesser Brothers, Reno.....	20.19	2.56
1650	Kee Ching, Virginia.....	2.25	0.29
1651	Kelly & Lindsay, Carson City.....	12.28	1.56
1652	Kent, I. H. Co., Fallon.....	387.55	49.17
1653	Kier, James M., Wonder.....	93.55	11.87
1654	King Drug Company, Sparks.....	1.20	0.15
1655	Kingsbury, The, Carson City.....	6.00	0.76
1656	Kitzmeyer, C. L., Carson City.....	2.94	0.37
1657	Knierim, Henry, Yerington.....	2.75	0.35
1658	Lane, A. & Co., Reno.....	144.99	18.39
1659	Lee, Thomas J., Goldfield.....	31.05	3.94
1660	Lemaire, A. D. & Sons, Inc., Battle Mountain.....	133.56	17.53
1661	Lindley & Co., Reno.....	146.22	18.55
1662	Lothrop-Davis Co., Tonopah.....	429.20	54.45
1663	Luning Feed Yard Co., Luning.....	43.08	5.47
1664	Luning Mercantile Co., Luning.....	90.32	11.46
1665	Lyon County Bank, Yerington.....	10.52	1.33
1666	Lyon County Pharmacy, Yerington.....	2.35	0.36
1667	Lyric Theater, Goldfield.....	3.96	0.50
1668	Ludwig Mercantile Co., Ludwig.....	31.40	3.93
1669	Macart, Jno., Ely.....	4.40	0.56
1670	Mahood Mercantile Co., Virginia.....	20.52	2.60
1671	Majestic Theater, Inc., Las Vegas.....	8.26	1.05
1672	Majestic Theater Bldg., Reno.....	93.89	11.91
1673	Manheim, A. B., Reno.....	87.74	11.13
1674	Marks, E., Goldfield.....	16.50	2.09
1675	Martin, William, Reno.....	21.77	2.76
1676	Mason Mercantile Co., Mason.....	498.40	63.23
	Forwarded.....	\$10,996.50	\$1,395.03

*Debit balance to the account of contributor has been deducted from amount of refund shown.

Dir. Vr. No.	Contributor and Address	Premiums	Refund
	Forwarded.....	\$10,996.50	\$1,895.03
1677	Mason Townsite Company, Mason.....	27.83	8.53
1678	Mason Valley Bank, Inc., Mason.....	58.95	7.48
1679	Matthews Cash Grocery, Reno.....	12.93	1.64
1680	Meyers, A. G., Carson City.....	121.10	15.86
1681	Miller, Frank T., Tonopah.....	19.80	2.51
1682	Miller & Bain, Winnemucca.....	37.53	4.76
1683	Miller & Dudley, Tonopah.....	14.61	1.85
1684	Mills, A. J., Goldfield.....	52.80	6.70
1685	Mitchell, W. I., Co., Reno.....	105.01	13.32
1686	Moore, S. R. Co., Tonopah.....	16.48	2.09
1687	Morris & Loring, Fallon.....	6.40	0.81
1688	Morse, W. G., Las Vegas.....	1.02	0.13
1689	Novada Oil Assn., Moapa.....	21.21	2.69
1690	Muller, J. A., Carson City.....	37.55	4.76
1691	Murdock, L. H., Ely.....	9.57	1.21
1692	Murphy, L. A., Aurora.....	9.88	1.19
1693	Mutual Theater Co., Yerington.....	22.25	2.82
1694	McCullough Drug Co., Inc., Reno.....	6.40	0.81
1695	McDonough, W., Yerington.....	2.61	0.33
1696	McGill Mercantile Co., McGill.....	39.92	5.06
1697	McLean & McSweeney, Tonopah.....	230.95	29.30
1698	Nannini Brothers, Manhattan.....	26.10	3.31
1699	National Mercantile Co., Rochester.....	19.67	2.50
1700	Nesbit Brothers, Goldfield.....	17.98	2.28
1701	Nevada Bakery, Sparks.....	3.95	0.50
1702	Nevada Grocery Co., Reno.....	6.63	0.84
1703	Nevada Hardware & Supply Co., Reno.....	129.62	16.44
1704	Nevada Mercantile Co., Ely.....	8.83	1.06
1705	Nevada Trading Co., Rochester.....	43.39	5.50
1706	Nevada Wholesale Grocery, Goldfield.....	15.49	1.97
1707	Nixon, K. I. Bldg., Reno.....	110.06	13.96
1708	Norris, A. H., Caliente.....	16.20	2.06
1709	Nye & Ormsby Bldg. Assn., Reno.....	8.11	1.03
1710	Odd Fellows Bldg. Assn., Reno.....	90.89	11.53
1711	Orr & Horsey, Pioche.....	4.40	0.56
1712	Palace Bakery, Reno.....	57.44	7.29
1713	Palace Dry Goods Co., Reno.....	31.00	3.93
1714	Palace Dry Goods Store, Reno.....	442.66	56.16
1715	Palace Hardware & Grocery Co., Goldfield.....	22.80	2.89
1716	Palmer, E. E., Beatty.....	82.43	10.46
1717	Park, W. D., Minden.....	81.50	10.34
1718	Parker & Sornerville, Reno.....	16.73	2.12
1719	Pearl, C. H., Tonopah.....	4.35	0.55
1720	Peck & Sample, Reno.....	65.67	8.33
1721	Penny, J. C. Co., Inc., Ely and McGill.....	28.46	3.61
1722	Penny, J. C. & O., Ely.....	5.44	0.69
1723	Peoples Brothers, Fallon.....	120.75	15.32
1724	Perkins, Dana, Reno, Lovelock, Sparks.....	91.90	11.66
1725	Perkins-GulHing Co., Reno.....	147.30	18.69
1726	Peterson, S., Sparks.....	177.37	22.50
1727	Pickett-Atterbury Co., Reno.....	3.87	0.49
1728	Pierce, Eugene, Sparks.....	3.75	0.48
1729	Pierery, Jos. C., Tonopah.....	26.64	3.38
1730	Pioche Livestock & Meat Co., Pioche.....	27.56	3.50
1731	Pleasant Grove Market, Lovelock.....	1.04	0.13
1732	Porter, H. D. & H. L., Rhyolite.....	1.10	0.14
1733	Prater, N. C., Virginia.....	23.10	2.93
1734	Prendergast & Conron, Searchlight.....	8.04	1.02
1735	Quilici Brothers, Wells.....	54.11	6.86
1736	Rasmussen, R. P., Luning.....	18.96	2.41
1737	Ratto & Rosa, Tonopah.....	0.90	0.11
1738	Reading Merc. & Trans. Co., Ludwig, Wellington, Hudson.....	404.56	51.32
1739	Reading Merc. & Trans. Co. (Receiver's account).....	98.48	12.49
1740	Receiver State Bank & Trust Co., Carson City.....	147.92	18.77
1741	Reinhart, E. & Co., Golconda.....	14.23	1.81
1742	Reinhart, E. & Co., Winnemucca.....	59.37	7.53
1743	Remington Typewriter Co., Inc., San Francisco.....	23.90	3.03
1744	Reno Cash Store, Reno.....	6.49	0.82
1745	Reno Electrical Works, Reno.....	18.73	2.38
1746	Reno Evening Gazette Pub. Co., Reno.....	82.23	10.43
1747	Reno Fair & Racing Assn., Reno.....	114.00	14.46
1748	Reno Fuel Yard, Reno.....	4.01	0.51
1749	Reno Grocery Co., Reno.....	252.92	32.09
1750	Reno Meat Co., Reno.....	257.40	32.65
1751	Reno Mercantile Co., Reno.....	119.11	15.11
1752	Reno Natl. Bank Bldg., Reno.....	16.55	2.10
1753	Reno Plumbing Co., Reno.....	15.06	1.91
1754	Reno Saddlery Co., Reno.....	10.08	1.23
1755	Reno Wall Paper & Paint Co., Reno.....	582.65	73.92
1756	Richard Mercantile Co., Tonopah.....	27.16	3.45
	Forwarded.....	\$16,151.34	\$2,048.97

*Debit balance to the account of contributor has been deducted from amount of refund shown

Div. Vr. No.	Contributor and Address	Premiums	Refund
	Forwarded.....	\$16,151.34	\$2,048.97
1757	Riepetown Bakery, Riepetown.....	6.98	0.88
1758	Roberts & Nutti, Tonopah.....	8.33	1.06
1759	Robinson Mercantile Co., Sparks.....	2.48	0.31
1760	Rogers & Reynolds, Goldfield.....	3.75	0.48
1761	Rotholz Brothers, Inc., Tonopah.....	74.73	9.48
1762	Roush, A., Tonopah.....	61.14	7.76
1763	Ryan & Stenson, Tonopah.....	5.81	0.74
1764	Ryan & Stenson, Virginia.....	7.58	0.96
1765	St. Pierre Shoe Co., Goldfield.....	6.91	0.88
1766	St. Pierre Shoe Co., Reno.....	5.45	0.69
1767	Savage Heating & Plumbing Co., Reno.....	121.83	15.89
1768	Scott, E. L., Aurora.....	3.60	0.46
1769	Scott, H. E., Rawhide.....	1.14	0.14
1770	Scott, J. W., Reno.....	2.97	0.38
1771	Searchlight Mercantile Co., Searchlight.....	19.95	2.53
1772	Semenza & Menanti, Reno.....	65.74	8.34
1773	Shank, W. J., Reno.....	6.40	0.81
1774	Shapira, Nathan, Ione.....	4.30	0.55
1775	Shier, Jno., Caliente.....	1.82	0.17
1776	Sierra Construction Co., Goldfield.....	309.11	39.21
1777	Sloan, C. B. & Co., Tonopah.....	8.31	1.12
1778	Slopansky, J. M., Ruth.....	9.68	1.23
1779	Smith, J. W., Tonopah.....	0.26	0.03
1780	Smith, Lloyd D., Las Vegas.....	6.78	0.86
1781	Smith & Sorenson, Tonopah.....	3.90	0.49
1782	Somerville, W. T., Tonopah.....	17.64	2.24
1783	Southern Nevada Abstract Co., Tonopah.....	76.66	9.73
1784	Sparks Grocery, Sparks.....	2.17	0.28
1785	Standard Oil Co., Reno, etc.....	1,386.49	173.35
1786	Stannard, Geo. B., Hawthorne.....	38.00	4.19
1787	Stevens, Joseph E. & Co., Ely.....	256.03	32.48
1788	Steptoe Drug Store, Ely.....	120.78	15.32
1789	Steptoe Meat Co., McGill.....	42.25	5.36
1790	Stock & Barnes, Tonopah.....	8.30	1.05
1791	Sullivan, T. B., Virginia.....	4.70	0.60
1792	Sunderland's, Inc., Reno.....	34.84	4.42
1793	Sunset Grocery, Elko.....	28.04	3.56
1794	Swift & Co., Reno.....	305.76	102.22
1795	T. & D. Theater, Reno.....	74.99	9.51
1796	Thomas Department Store, Las Vegas.....	56.45	7.16
1797	Thompson, A. S. Co., Pioche.....	73.02	9.26
1798	Tonopah Drug Co., Tonopah.....	10.20	1.29
1799	Tonopah Electric Tire Co., Tonopah.....	86.08	10.92
1800	Tonopah & Goldfield Amusement Co., Goldfield.....	13.83	1.75
1801	Tonopah & Goldfield Amusement Co., Tonopah.....	18.17	2.31
1802	Tonopah & Goldfield Grocery, Goldfield.....	4.08	0.52
1803	Tonopah & Goldfield Grocery, Tonopah.....	4.42	0.56
1804	Tonopah Mines Hospital Assn., Tonopah.....	177.36	22.50
1805	Travis, A. A., Aurora.....	10.56	1.34
1806	Turner, F. M., Yerington.....	0.55	0.07
1807	Union Label Mercantile Co., Ely.....	21.41	2.72
1808	Union Market, Reno.....	18.04	2.29
1809	Union Oil Company of California, Reno.....	45.03	5.71
1810	Virginia Market, Reno.....	198.39	25.17
1811	Walker River Supply Co., Mason.....	18.99	2.41
1812	Walsh, E. J., Carson City.....	139.11	17.65
1813	Warren, A. H., Mason.....	1.32	0.17
1814	Warren & Van Alstine, Yerington.....	5.72	0.78
1815	Washoe County Bank, Reno.....	571.54	72.50
1816	Washoe Grocery, Reno.....	9.29	1.18
1817	Washoe Wood & Coal Co., Reno.....	174.27	22.11
1818	Weck Drug Co., Reno.....	2.98	0.38
1819	Welase, Paul, Tonopah.....	155.31	19.70
1820	Western Hotel Supply Co., Reno.....	16.28	2.07
1821	Western Meat Co., San Francisco.....	17.57	2.23
1822	Wigwam Theater, Reno.....	16.71	2.12
1823	Williams, W. W., Fallon.....	15.17	1.92
1824	Wilson, Bates Furniture Co., Ely.....	135.81	17.23
1825	Wilson & Green, Elko.....	3.91	0.50
1826	Winnemucca State Bank, Winnemucca.....	5.70	0.72
1827	Wood, Curtis Co., Reno.....	46.00	5.84
1828	Wood, Nelson Co., Minden.....	21.68	2.75
1829	Wood, Sullivan Hdw. Co., Tonopah.....	75.73	9.60
1830	Woolworth, F. W. & Co., Reno.....	112.35	14.25
1831	Wright, J., Yerington.....	8.25	1.05
1832	Young, Goodin Co., Lovelock.....	188.03	23.85
		\$22,250.70	\$2,822.76

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CARSON CITY, NEVADA

STATE PRINTING OFFICE, : JOE FARNSWORTH, SUPERINTENDENT

1919

IRRIGATION OF FIELD CROPS IN NEVADA

By
C. S. KNIGHT
and
GEORGE HARDMAN



BULLETIN No. 96

**AGRICULTURAL EXPERIMENT STATION
THE UNIVERSITY OF NEVADA**

CARSON CITY, NEVADA

**STATE PRINTING OFFICE : : : JOE FARNSWORTH, SUPERINTENDENT
1919**



NEVADA AGRICULTURAL EXPERIMENT STATION

BOARD OF CONTROL

HON. A. E. CHENEY (1921)	. . . . .	Reno
HON. B. F. CURLER (1921)	. . . . .	Elko
HON. WALTER E. PRATT (1925)	Goldfield
HON. MRS. W. H. HOOD (1927)	Reno
HON. MILES E. NORTH (1929)	Reno

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IRRIGATION OF FIELD CROPS IN NEVADA

By C. S. KNIGHT and GEORGE HARDMAN

INTRODUCTION

The approximate area of land in the State of Nevada is 70,285,440 acres. Of this amount about 900,000 acres, or 1.3 per cent, were irrigated in 1918. The State abounds in rich agricultural land, but the lack of additional water for irrigation prevents the cultivation of regions which are now lying idle as waste desert areas. To increase the area of irrigated land it becomes necessary either to furnish additional water by means of artesian wells or pumping, or to make a more conservative use of the present water supply. The irrigation experiments at the Nevada Station deal chiefly with the latter of these two methods.

Alfalfa, wheat, and potatoes are three of the most important cultivated crops grown in Nevada. Practically all of the alfalfa, most of the wheat, and all of the potatoes are grown under irrigation. In the course of the last nine years the acreage of alfalfa in this State increased from 89,000 to about 145,000 acres, or over 60 per cent; and the yield from 235,000 to about 500,000 tons, or an increase in production of 112 per cent. In 1918 about 80,000 acres of wheat were raised in Nevada, with a production of about 2,000,000 bushels. Approximately one-third of the crop was grown in Humboldt County, and over 80 per cent in Humboldt, Washoe, Churchill, Lyon, and Douglas Counties. The potato crop for the same year amounted to about 15,000 acres, with a production of approximately 75,000 tons. Over 60 per cent of this crop was produced in Lyon, Churchill, Washoe, and Douglas Counties.

A large part of the acreage of these crops in Nevada receives too much water to obtain the best yield and quality of crops, and for maintaining high-producing soils. The common practice in Nevada is to irrigate alfalfa at regular intervals with little regard to the actual needs of the crop for water, or to the possible injury to the soil by excessive irrigation. It is important, therefore, that the proper method of irrigation and the best time and depth of application be known. Furthermore, in years of water shortage irrigations should be omitted at those stages of growth when the crop is least affected. Pumped water is expensive as compared with surface water; hence, it is of value to the grower to know the least amount of water necessary to obtain the best results with the various crops. Since the supply of water is strictly limited and the supply of irrigable land is practically unlimited, it becomes of vital importance to the State to have authentic information on the most economical amounts of water to apply, consistent with profitable returns.

In view of the above facts, a series of experiments has been conducted during the last five years by the Nevada Agricultural Experiment Station comparing the different methods of application to determine the amount of water required and the best time to apply water to the

NOTE—The authors are indebted to J. B. Menardi who assisted in the field work during the three-year period, 1914-1917; also to F. L. Bixby, Senior Irrigation Engineer, U. S. Department of Agriculture, for valuable suggestions, assistance, and diagrams.

crop to obtain the most favorable results; at which stage or stages of growth an application may be eliminated without seriously affecting the yield of grain; and also the most practical depths of applications when only two irrigations are possible. The average results of experiments on the irrigation of wheat, alfalfa, potatoes, red clover, and sugar-beets, together with results of earlier work on alfalfa, wheat, and barley, are given in this bulletin.

NEVADA WATER SUPPLY AND DRAINAGE AREAS

Nevada lies almost wholly within the Great Basin. In fact, with the exception of small streams tributary to the Snake River in the north-eastern section of Nevada and some branches of the Colorado River in the southeastern section, the rivers drain into the interior of the State. These rivers are fed from the snowfall on the mountains of Nevada and the eastern slope of the Sierra in California. The Humboldt, Truckee, Carson, Walker, and Muddy are the principal rivers supplying water for irrigation.

Humboldt River.

This river has a length of 350 miles of air line, but measured in its irregular course it traverses a distance of about 1,000 miles. The melting snows of the Ruby, East Humboldt, Independence, and Diamond ranges are the sources of this river; it drains into the Humboldt Sink at the lower end of the Lovelock Valley. This stream has a drainage basin of 13,800 square miles, all within Nevada. More than 50 per cent of the irrigated area in this State receives its water from the Humboldt River.

Truckee River.

This is the most northerly river on the eastern slope of the Sierra emptying into the Great Basin. It receives its water supply chiefly from mountain lakes, which are fed by the melting snow of the Sierra in California. It is the outlet of Lake Tahoe, which has an elevation of 6,225 feet and covers an area of 193 square miles. The course of the Truckee is about 110 miles long, in which distance it has a total fall of 2,350 feet. It has a drainage basin of 2,310 square miles.

Carson River.

This river is formed by the East and West Forks, which receive their water supply from the melting snow on the eastern slopes of the Sierra Nevada in California. The river is about 120 miles long and has a total fall of 1,900 feet. It has a drainage basin in Nevada of 988 square miles.

Walker River.

This is the most southerly river draining from the Sierra Nevada into the Great Basin. It is formed by the East and West Forks, whose basins are separated by the Sweetwater range of mountains. The East Fork is fed by the melting snows from the eastern slope of the Sweetwater range and the western slope of the Walker River range, while the West Fork drains part of the eastern slope of the Sierra. This river is about 120 miles long, has a total fall of 1,600 feet, and a drainage basin of 2,420 square miles.

Muddy River.

The Muddy River is located in the southeastern part of Nevada. It receives its supply of water from constantly flowing springs in Arrow Canyon, and drains into the Virgin River, a tributary of the Colorado River. It has been estimated that the average annual flow of the river is about 28,000 acre-feet of water.

Small Streams in Northern Nevada.

The small streams in northern Nevada furnish water for about 14 per cent of the total irrigated area. The principal streams are the White River, Duck Creek, Steptoe Creek, Salmon River, Bruneau River, and Owyhee River. The White River is 75 miles long, and has an average annual run-off of about 28,000 acre-feet. Duck Creek and Steptoe Creek supply Steptoe Valley, and the Salmon, Bruneau, and Owyhee irrigate a considerable area in Nevada before emptying into the Snake River basin.

Artesian Wells in Southern Nevada.

In southern Nevada about 100 artesian wells, which develop flows at from 200- to 400-foot depths, furnish the water supply for the irrigation of a considerable area, the greater portion of which is located in the Las Vegas and Pahrump Valleys.

Washoe Lake.

By means of large pumping plants several thousand acres of land have been placed under intensive cultivation with the water from Washoe Lake. The water is elevated from 40 to 125 feet by the different plants.

IRRIGATED AREA IN NEVADA

The following table taken from the twelfth and thirteenth census of the United States, shows the total irrigated area in Nevada for 1900 and 1910, with the increase in per cent for the ten-year period:

IRRIGATED AREA BY COUNTIES IN NEVADA—ACREAGE

County	1900	1910	Increase per cent
The State.....	504,168	701,833	39.2
Churchill.....	29,533	35,114	18.9
Clark.....	(*)	8,116	.....
Douglas.....	25,861	32,181	24.4
Elko.....	156,446	183,552	17.3
Esmeralda ^b	6,181	14,011	126.7
Eureka.....	21,831	18,715	14.3
Humboldt.....	124,959	207,753	66.3
Lander.....	18,803	23,342	24.1
Lincoln ^a	9,962	9,907	(*)
Lyon.....	32,422	62,148	91.7
Nye.....	12,666	19,978	57.7
Ormsby.....	1,563	2,426	55.2
Storey.....	690	891	29.1
Washoe.....	43,855	50,904	16.0
White Pine.....	19,366	32,795	69.3

It is noted from this table that about 30 per cent of the total irrigated area is located in Humboldt County and 56 per cent in Humboldt and Elko Counties, this area being irrigated from the Humboldt River and its tributaries.

^aChange in boundary. Lincoln County divided into Lincoln and Clark Counties.

^bChange in boundary. Esmeralda County divided into Esmeralda and Mineral Counties.

Methods of Irrigation.

The greater portion of the alfalfa acreage in Nevada is irrigated by some form of flooding. In the Lovelock Valley the border method of flooding is generally used; on the Truckee-Carson Project, the check system of flooding; in Washoe Valley, flooding from field laterals and by the furrow method; and in the Carson Valley the furrow or corrugation method is most common.

On light sandy soils it is very important to have available a sufficient head of water to flood the field in a short time so that very little water will be wasted by percolation through the soil beyond the depth of the plant roots. With the heavy clay loam or clay soils a relatively small head of water is required for a longer period of time, since the water percolates less rapidly through these soils. The heavy soils, however, have greater power for retaining water, and are better suited to fewer and heavier irrigations. Frequent light applications of water generally result in the best crops on the sandy and sandy-loam soils. Each



Plate 2—An excess of water is used in this method of flooding.

method of irrigation is peculiarly adapted to the soil conditions and slope of the land in the district where it is practiced.

Flooding from Field Ditches.

This is the cheapest method to install and the most wasteful of water, also a great deal of labor is required in distributing the water over the field. It is sometimes called the contour method, since the field ditches carry the water along the ridges and distribute it down the slopes over the field. This method is applicable to new lands for the first crop; to heavy, rocky, or very shallow soils where leveling is not advisable; and to small heads of water. One man can handle from two to four second-feet of water under this system.

Flooding in Borders.

Flooding in borders or border checks, where the land is comparatively level and does not bake excessively, is one of the most satisfactory methods of irrigation for either grain or alfalfa. This system is

practiced in Nevada on comparatively level land where a large head of water is obtainable. In preparing the land for this system, great care must be exercised in leveling the land between the border levees. For the rough leveling a Fresno scraper is commonly used, being followed by a tailboard scraper to make the levees. Another commonly used implement in Nevada is a large scraper mounted on four wheels with a heavy iron blade which works something on the order of a road grader. Where the levees are constructed with the tailboard scraper the operator drives across the field in the opposite direction to the levees, gathering the dirt for the levees from the surface of the borders, and at the same time leveling the borders.

The borders vary in length from 300 to 1,300 feet, with an average of 500 feet depending upon the slope of the land and the texture of the soil. The width may vary from 30 to 100 feet, with an average of about 60 feet. In irrigating, the water is turned into the border and carried down its entire length, the waste water either being picked up by the head ditch of the next series of border checks, or flowing into a drainage ditch. One man can handle about six second-feet of water under this method.

The system of border irrigation, practiced to a large extent in the Lovelock Valley, differs from the method explained above as follows:

When the field is properly leveled with a grader, the borders are marked off on the head line from sixty to ninety feet wide. A large V marker or ditcher is then used to make the levees, separating the borders at regular intervals. This is a heavy implement, mounted on four wheels, controlled by a system of levers, and requiring about sixteen horses for its operation. After these borders are seeded, a head ditch is then made with the same ditcher to carry the water to the borders. If one man is applying the water, he turns in as large a head as can be properly handled. Considerable experience is needed in this system of applying water, because, as soon as the soil at the upper ends of the borders is sufficiently wet, the water must be taken down the ditches between the borders to irrigate the lower portions of the land. These borders vary from 1,000 to 5,000 feet in length, depending upon the slope of the land. With a properly installed system the water can be brought down one side of the field for a considerable distance in a diagonal direction, instead of bringing the water down the ditch and turning it into the borders at frequent intervals. In this way a large tract can be irrigated in a day by one man. The ground is flooded for the first irrigation only, subsequent applications being made by allowing the water to seep from the ditches between the borders. In sections of Nevada where this system is practiced, wonderful crops of wheat and alfalfa are produced, but in such regions the soil is of a loose nature, contains a large amount of humus and does not bake after wetting. In this system one experienced irrigator can handle about six second-feet of water.

Flooding in Checks or Basins.

In this system of irrigation the levees are run across the field in both directions, dividing it into a series of checks or basins. In Nevada this method is largely practiced on new lands that require a great deal of leveling. The level tracts can be checked ready for the water with less expense than for any other system of flooding. This method is also

desirable on lands that will not soak up readily when the water is run in furrows. On the Newlands Irrigation Project, where this system is commonly used in the production of hay and grain, the levees dividing the checks or basins are wide and low, and are generally covered with a crop. They are so constructed to prevent any waste of land and to make possible the harvesting of the crop with a mower or binder. In such a system some checks are higher than others. Water is turned into the higher checks, and, when the ground is sufficiently wet, it is taken off and run into the lower checks, and so on, until all the ground is irrigated. Although considerable water is lost by evaporation, very little goes into the drainage ditches. If the land has a gentle slope, the installation of this system is expensive as compared with the border method and flooding from field laterals. A large head of water can be

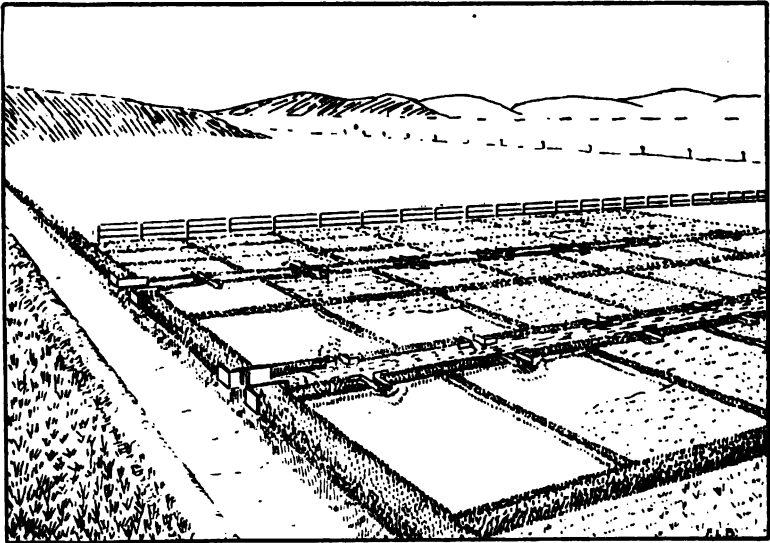


Plate 3—Check method of irrigation.

used with this system and one man can handle from seven to eight second-feet. On the Newlands Project the check system is being rapidly replaced by the border method.

Furrow Irrigation.

Where the conditions are suitable and the land is sufficiently friable and mellow, the furrow method of irrigation is best adapted to the highest returns of hay and grain in Nevada. In this system the water is run through the field in small furrows and diffused laterally through the soil, but should not run over the surface. This system is adapted to small irrigating streams, considerable slopes, and heavy soils. The water may run in few or many furrows, or it may be run across the slope at any angle for the desired flow of water giving the heavy soils time to soak up. The feed ditches are nearly level and are generally

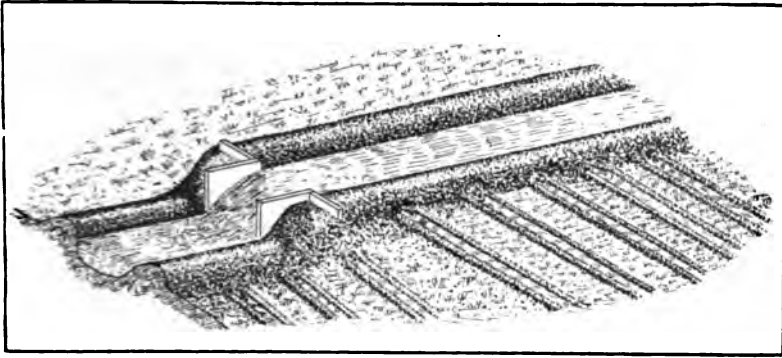


Plate 4—Furrow irrigation by means of pipes.

run across the slope of the field. In Nevada a great deal of trouble has been encountered on light soils in the washing away of the banks where the water is taken from the distributing ditch to the furrows. This condition has been met by the use of galvanized iron pipes from one and one-half to two inches in diameter and two feet long, or by the use of wooden spile made from lath or material sawed for the purpose. These pipes are placed in the bank of the distributing ditch and each pipe furnishes water for two to six furrows, depending upon the head



Plate 5—A minimum amount of water is used in the furrow method of irrigation.

of water in the feed ditch. By such a system a large field can be irrigated by one man, since his chief duty is to see that the proper head of water is maintained in the distributing ditches; also, the water is more evenly distributed in the furrows, so that it reaches the lower part of the field in the different furrows, at about the same time.

On the heavy soils of the Truckee Meadows practically every alfalfa field is furrowed, but the land is usually flooded from field ditches, the furrows providing easy channels for the water to the lower end of the field and drainage for the surplus water after each irrigation, which might otherwise stand in the low places and retard the growth of the crop. In irrigating grain more care must be taken to prevent the water from flooding the surface of the ground between the furrows.

The furrows vary in length with the slope of the land and the nature of the soil from 200 to 800 feet, the longer furrows being possible on the heavier lands with gentle slopes. Feed ditches run across the fields at intervals of from 200 to 800 feet, and in turn furnish water for the irrigation of the furrows below. Although the initial expense of installing this system is high, the water is easily handled and the expense of irrigating is small. A smaller head of water is used with this system than with the others.

IMPORTANT FACTORS AFFECTING DUTY OF WATER IN NEVADA

Type of Soil.

The type of soil probably causes greater variation in the amount of water required than any other one factor. In 1906, 12½ acres of alfalfa, at the Experiment Station, grown on gravelly soil with a very open gravelly subsoil, received a total depth of 8.5 feet of water and produced only two tons of hay per acre. The yield per acre-foot of water was only 0.24 tons. During the same year two acres of alfalfa grown on a sandy clay soil with a clay subsoil received a total depth of only 3 feet of water and produced 7.36 tons per acre or a yield of 2.45 tons per acre-foot of water.

Topography.

On lands that are rolling or that have steep slopes the amount of run-off is large, thus increasing the total irrigation required to produce the best crops. On the more uniformly level lands with light slopes practically all of the water applied may be retained by the land. On certain alfalfa fields in the Truckee Meadows, where the land is rolling, the total annual depth of irrigation varies from 5 to 10 feet, but more than one-half of this amount may be run-off that is used again on lower lands or drains back into the Truckee River.

Hardpan Near the Surface.

The following table shows the results obtained in 1910 on an acre of alfalfa, which received twelve irrigations with a total of about six acre-feet of water:

EFFECT OF HARDPAN ON THE AMOUNT OF WATER REQUIRED FOR ALFALFA*

<i>Date of irrigation—</i>	<i>Depth of irrigation, feet</i>	<i>First cutting, tons</i>	<i>Yield per acre</i>		
			<i>Second cutting, tons</i>	<i>Third cutting, tons</i>	
April 19.....	0.126				
April 20.....	0.239				
May 5.....	0.408				
May 23.....	0.646				
June 3.....	0.662				
Total.....	2.081	1.65			
June 16.....	0.759				
June 27.....	0.537				
July 7.....	0.225				
July 8.....	0.436				
Total.....	1.957	.....	1.55		
July 29.....	0.523				
August 6.....	0.676				
August 12.....	0.661				
Total.....	1.860	.....	.....		1.77
September 14.....	0.390	Irrigation for pasture			
Total irrigation.....	6.288	Total yield.....			4.97

*A heavy clay soil with a hardpan layer very close to the surface. The depth of irrigation includes run-off which was not measured.

It is noted from these results that soils with hardpan near the surface have very little capacity for retaining water, and in this instance about twice as much water is used to produce a crop as compared with similar soils without a hardpan layer near the surface.

Influence of Annual Rainfall.

In many States where irrigation is practiced the annual precipitation is an important factor to be considered in the results of investigations of irrigation methods, and particularly in the duty of water in field practice. The following table gives the total precipitation and monthly distribution for the past five years and for a period of eighteen years at the Experiment Station:

MONTHLY PRECIPITATION IN INCHES AT THE AGRICULTURAL EXPERIMENT STATION, FIVE-YEAR PERIOD, 1914-1918*

<i>Month</i>	<i>1914</i>	<i>1915</i>	<i>1916</i>	<i>1917</i>	<i>1918</i>	<i>Average five years 1900-1918</i>	<i>Average 1900-1918</i>
January	5.46	0.55	6.76	0.05	0.13	2.59	1.99
February	0.86	2.59	0.59	2.01	1.73	1.56	1.20
March	T	0.16	0.33	0.74	2.51	0.75	0.97
April	0.70	0.33	0.11	0.28	0.16	0.32	0.52
May	0.11	0.52	T	1.18	0.25	0.41	0.48
June	0.29	0.00	0.11	0.06	0.14	0.12	0.25
July	T	0.04	T	0.04	T	0.02	0.44
August	0.38	T	0.04	0.12	T	0.11	0.32
September	0.05	0.06	0.35	T	2.41	0.57	0.33
October	0.16	T	1.13	T	0.75	0.41	0.41
November	T	0.28	0.05	0.68	0.37	0.28	0.51
December	0.70	1.09	0.97	0.27	0.40	0.69	0.89
Total	8.71	5.62	10.44	5.43	8.85	7.83	8.31

*Information secured from the U. S. Weather Bureau, Reno, Nevada.

It will be seen from the above table that the average annual precipitation for the five-year period of irrigation investigations amounted to 7.83 inches. In May, 1917, the rainfall was 1.18 inches. With this exception, during no one month of the growing season throughout the five-year period was sufficient rainfall received to affect the moisture content of the soil; that is, the small amount of precipitation at any one time was subject to evaporation within a few hours. The entire rainfall in September, 1918, occurred after the crops were harvested. The results of these experiments are therefore based entirely on the water supplied by irrigation.

The average precipitation over the entire State, according to the reports of the United States Weather Bureau, is about 8.5 inches per year. The only source of Nevada's water supply is the snowfall upon her own mountain ranges and the precipitation upon the eastern slope of the Sierra in California. Throughout the agricultural districts of Nevada the rainfall is, in general, so slight and so poorly distributed during the growing season that it cannot be depended upon to supplement irrigation in supplying the moisture needs of crops.

Effect of Evaporation on the Amount of Water Required.

The following table gives the average evaporation by months at the Experiment Station from still water surfaces for the year 1912:

EVAPORATION FROM WATER SURFACES AT THE EXPERIMENT STATION IN 1912

<i>Month</i>	<i>Evaporation, feet</i>
January.....	0.101
February.....	0.143
March.....	0.110
April.....	0.289
May.....	0.569
June.....	0.867
July.....	0.950
August.....	0.951
September.....	0.608
October.....	0.452
November.....	0.182
December.....	0.134
Total.....	5.356

The annual evaporation from free water surfaces at the Experiment Station is shown to exceed five feet, the greatest losses occurring during the months of June, July, and August. At the Experiment Station on cultivated land the average loss of water annually by evaporation amounts to about fifteen inches. It is quite evident from these results that where the annual evaporation is high, more water is required to produce a crop than in districts where the normal conditions of evaporation prevail.

During the years 1908 and 1909 the Nevada Agricultural Experiment Station, in cooperation with the Office of Irrigation Investigations of the U. S. Department of Agriculture, conducted a series of experiments on the losses of water by evaporation from irrigated soils. These investigations were made at the Experiment Station Farm near Reno at an altitude of 4,490 feet on a sandy alluvial loam soil, which is typical of a large portion of the irrigated area in Nevada. The detailed results of these experiments are found in Bulletin 248, Office of Experiment Stations, U. S. Department of Agriculture. A summary of the results of this work follows.

Effect of Soil Mulches of Different Depths.

The following table gives the average evaporation from soils protected by different depths of soil mulches at the Nevada Agricultural Experiment Station for a period of three weeks (June 9-30, and September 1-22, 1908), with six inches of water applied:

<i>Depth of mulch</i>	<i>Loss in inches</i>	<i>Loss of total application, per cent</i>
Water surface.....	4.68	78.0
No mulch.....	1.41	23.6
3-inch mulch.....	0.88	14.6
6-inch mulch.....	0.36	6.0
9-inch mulch.....	0.17	2.9

The unmulched surface shows a loss, during the three weeks, of 23.6 per cent of the six inches of water applied. The use of the 3-inch mulch shows a loss of 62.5 per cent, the 6-inch mulch a loss of 25.5 per cent, and the 9-inch mulch a loss of 12 per cent, respectively, of the loss from the unmulched surface. These results indicate the value of a soil mulch when land is prepared for cropping and when possible during the growing season, especially with cultivated crops.

Effect of Cultivation at Different Depths.

The following table gives the average evaporation losses from cultivated and uncultivated surfaces at the Nevada Agricultural Experiment Station for a period of twenty-eight days (May 7-June 4, and June 8-July 6, 1909), with six inches of water applied:

<i>Cultivation</i>	<i>Loss in inches</i>	<i>Loss of total application, per cent</i>
Water surface.....	8.49	.....
Cultivated six inches.....	1.09	18.2
Uncultivated.....	1.51	25.2

Duplicate tests were made in this experiment, and where cultivation was given, the soil was stirred to a depth of six inches in a manner similar to natural field methods. The cultivated surface showed a loss of 72.2 per cent, or a saving of 27.8 per cent of that receiving no cultivation, thus verifying the results previously mentioned in the value of cultivation to form a soil mulch in preventing the loss of water from the soil by evaporation.

Effect of Shallow- and Deep-Furrow Irrigation.

The following table gives the average evaporation losses from surfaces irrigated by flooding, and with furrows of different depths at the Nevada Agricultural Experiment Station for a period of twenty-eight days (July 8-August 5, and August 10-September 7, 1909), with six inches of water applied:

<i>Depth of furrow</i>	<i>Loss in inches</i>	<i>Loss of total application, per cent</i>
Water surface.....	11.13	.....
Flooded.....	1.05	17.5
3-inch furrow.....	0.91	15.2
6-inch furrow.....	0.73	12.2
9-inch furrow.....	0.55	9.2

The results of this experiment show that water run in furrows, 3, 6, and 9 inches deep, caused a saving of 13.3 per cent, 30.5 per cent and 47.6 per cent, respectively, of the total loss from the flooded surface during this period of 28 days. Where the supply of water for irrigation is limited and the corrugation method of applying water is practical the use of furrows from 6 to 9 inches deep will undoubtedly

result in greatly decreasing the loss of water from the soil by evaporation.

Overirrigation.

The use of excessive amounts of water tends to cause considerable losses from surface run-off and deep percolation. At the same time the quality and very often the quantity of the crop are reduced. Excessive irrigation of a wheat crop tends to produce a soft, mealy kernel that is not good for milling purposes. The experience of the Experiment Station with Marquis wheat under irrigation indicates that it is possible to produce a good grade of hard wheat with proper irrigation. After six years under irrigation this wheat ranks equal to the best wheat from the hard wheat sections of the Middle West. Overirrigation of alfalfa produces coarse stems and a smaller proportion of leaves. Potatoes become knotty and produce a second growth when given too much water.

EARLY INVESTIGATIONS

Duty of Water on Alfalfa.

The following table shows the average results in total irrigation, yield per acre and yield per acre-foot of water:

DUTY OF WATER ON ALFALFA AT THE EXPERIMENT STATION, 1906-1911

Year	No. of plat	Size of plat, acres	Total irrigation, feet	Yield per acre, tons	Yield per acre-foot of water, tons
1906.....		2	3.00	7.36	2.45
Average.....			3.00	7.36	2.45
1907.....	20	1	3.47	5.63	1.62
	22	1	2.80	5.11	1.82
	24-25	2	2.93	7.04	2.40
Average.....			3.07	5.93	1.93
1908.....	20	1	4.32	7.12	1.54
	21	1	3.30	6.02	1.69
	22	1	2.47	6.04	2.20
	23	1	2.92	5.66	1.46
	24-25	2	4.76	5.13	1.02
Average.....			3.55	5.99	1.58
1909.....	15		2.22	4.35	1.95
	16		3.48	4.23	1.21
	24		5.28	6.57	1.22
	25		2.98	6.21	2.09
	26, 27, 28		3.57	4.15	1.16
	20		2.54	6.94	2.73
	21		2.33	6.50	2.78
	22		3.76	4.60	1.22
	23		2.21	6.22	2.81
Average.....			3.15	5.53	1.91
1910.....	20		5.08	7.52	1.48
	21		3.05	6.61	2.16
	22		2.76	5.92	2.14
	23		2.61	6.35	2.43
	24		5.78	6.59	1.14
	25		3.58	6.02	1.68
Average.....			3.81	6.50	1.84
1911.....	20		3.64	5.15	1.41
	21		2.66	5.31	1.99
	22		2.25	4.56	2.02
	23		2.17	4.27	1.96
	24		3.87	3.34	0.86
	25		3.87	3.15	0.81
Average.....			3.08	4.30	1.51
Average for 6-year period, 1906-1911.....			3.27	5.93	1.87

NOTE—Sandy clay soil. Water measured from weir-box at an average distance of one-fourth mile from plats, applied under field conditions. Waste water from plats not measured.

It is noted that the greatest average annual total irrigation of 3.81 feet was given in 1910 with the second highest yield of 6.50 tons per acre or slightly above the average for the six-year period. During every other year the average total irrigation was less than 3.6 feet, or averaging 3.17 feet. The highest yield of 7.36 tons per acre was obtained in 1906 with a total irrigation of three feet of water. The average results for the six-year period show a yield of 5.93 tons per acre with a total irrigation of 3.27 feet, or at the rate of 1.87 tons per acre-foot of water.

Duty of Water on Crops Under Field Conditions in the Carson Valley, 1907.

In 1907 the Experiment Station in cooperation with Irrigation Investigations, United States Department of Agriculture, made a number of water duty determinations on the ranch of the Dangberg Land & Cattle Company in the Carson Valley. The following table gives the results of these determinations, including number of irrigations, depth of irrigation, yield per acre, and yield per acre-foot of water:

DUTY OF WATER ON FIELD CROPS AT THE DANGBERG RANCH, CARSON VALLEY, 1907*
ALFALFA

<i>Crop</i>	<i>No. of irrigations</i>	<i>Total irrigation, feet</i>	<i>Date of cutting</i>	<i>Yield per acre, tons</i>	<i>Yield per acre-foot of water, tons</i>
<i>Field No. 1—81.32 Acres</i>					
Alfalfa and Timothy, first crop.....	3	3.16	July 22-26	3.87	1.23
Alfalfa, second crop....	3	2.71	Oct. 4-8	2.46	0.90
Total.....		5.87		6.33	†1.06
<i>Field No. 2—80.50 Acres</i>					
Alfalfa, first crop.....	2	3.08	July 1-4	1.68	0.55
Alfalfa, second crop....	2	2.24	Sept. 5-8	1.49	0.66
Total.....		5.32		3.17	†0.60
<i>Field No. 3—102.66 Acres</i>					
Alfalfa, first crop.....	3	3.40	Aug. 16-20	2.02	0.85
Alfalfa, second crop. (Used for pasture balance of the season.)					
Total.....		3.40		2.92	
<i>Field No. 8—50 Acres</i>					
Alfalfa, first crop.....	3	2.94	July 22-23	3.40	1.16
Alfalfa, second crop....	2	2.02	Sept. 18-20	2.40	1.18
Total.....		4.96		5.80	†1.17
Average for fields 1, 2, and 8....		5.38		5.10	0.95

BARLEY AND WHEAT

<i>Field No. 1</i>					
Barley.....	3	2.88		bushels 61.10	bushels 21.48
<i>Field No. 2</i>					
Barley.....	3	2.68		84.50	31.50
<i>Field No. 3</i>					
Barley.....	3	2.48		78.60	31.70
Average—Barley.....	3	2.68		74.70	28.29
Wheat.....	2	2.33		44.00	19.00

*The yields shown in these tables are the results of common practice on the Dangberg ranch, one of the largest cultivated ranches in the State. The land represented by these fields was in a high state of cultivation, contained an excellent stand of alfalfa, and was irrigated by the furrow method. The depth of irrigation includes run-off, which was not measured.

†Average.



Plate 6—Overirrigation brings an excess of alkali to the surface. Note the thin stand of wheat on this land.

The average results for fields 1, 2 and 8 shows a yield of 5.1 tons of alfalfa per acre with a total irrigation of 5.38 feet, which gives a yield of 0.95 tons per acre-foot of water. The three fields of barley show an average total irrigation of 2.68 feet with a yield of 74.7 bushels, and a yield per acre-foot of water of 28.29 bushels. One field of wheat gave a production of 44 bushels per acre and 19 bushels per acre-foot of water with 2.33 feet applied.

RECENT INVESTIGATIONS

GENERAL PLAN

Location and Soil Conditions.

This investigation of the irrigation of field crops was conducted at the Agricultural Experiment Station Farm at Reno during the five-year period, 1914–1918. The soil on these fields varies from a sandy loam to a clay loam, has an average depth of four feet, and is underlaid with coarse sand and gravel.



Plate 7—Method used in setting calibrated pipes.

The land was maintained in a relatively high state of fertility during the period of the experiment.

Measurement of Water.

The water applied to each plat was carefully measured by running it through calibrated iron pipes two inches in diameter by twenty-four inches long, set level in the bank of the distributing ditch and in the same horizontal plane. This provided for the measurement of water as it entered the plat, eliminating any possible error due to evaporation or seepage in the distributing laterals which often occurs when the measuring device is located at a distance from the plat. The head of water was constantly maintained at four inches by providing an overflow into a drainage ditch. The applications were so regulated that all of the water applied was used by the plats, thus preventing any run-off.

System of Checking.

To prevent any appreciable error due to variation in soil, a very

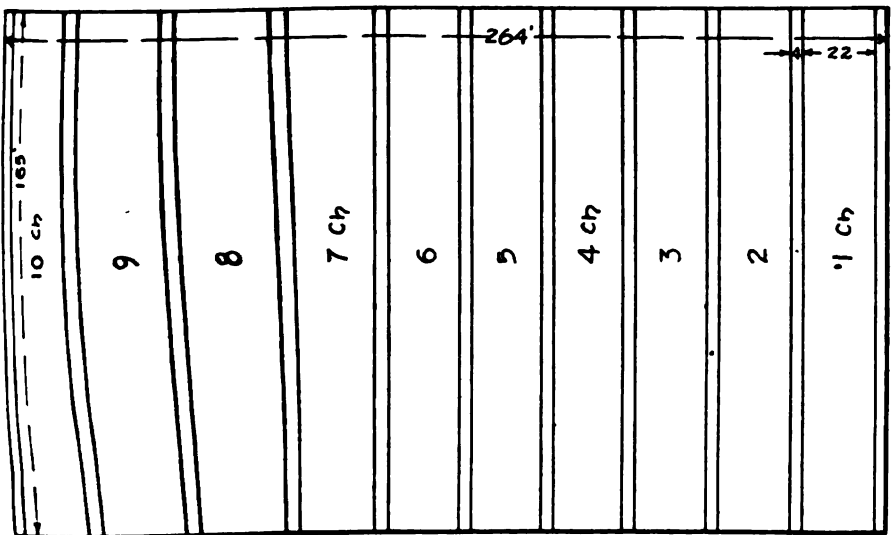


Plate 8—Irrigation of Wheat. Arrangement of plats and checks.

careful system of checks was used, their frequency varying with the size of the experimental plats. With wheat, potatoes and sugar-beets every third plat was a check. Thus, by revising the actual yields of the plats in accordance with the checks, the variation in yields due to the difference in soil was largely removed.

Harvesting.

In harvesting the crops in this experiment the outside portion of each plat was eliminated to prevent as far as possible any error due to seepage from adjacent plats. With wheat, alfalfa, and clover a four-foot cut was made around each plat, and the remaining areas were carefully measured before harvest. The two outside rows were eliminated from the potato and sugar-beet plats.

Soil Moisture.

Soil moisture determinations were made each year before the first

irrigation and at various intervals during the period of growth of the crops. Soil samples were taken from three locations in each plat for each foot to a depth of four feet. The object of these investigations was to determine the effect of different methods of irrigation on the soil moisture content at various periods of growth.

IRRIGATION OF ALFALFA

The irrigation experiment with alfalfa was conducted during the four-year period, 1915-1918, and included twelve plats, each 23 feet wide by 290 feet long. The plats were separated by levees four feet wide and high enough to prevent any overflow from one plat to another.

The alfalfa was irrigated by the furrow method, small furrows being

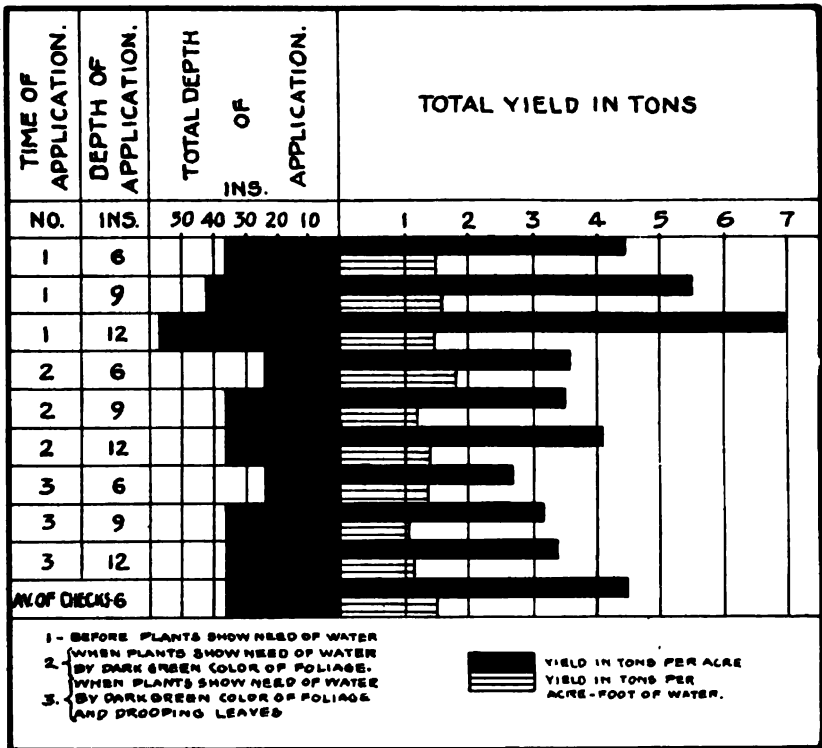


Plate 9—Irrigation of Alfalfa. Average results for the four-year period, 1915-1918, showing effect of irrigation on yield per acre and yield per acre-foot of water.

used at intervals of three feet to provide a ready channel for water to the lower ends of the plats. Water was measured into each plat through three pipes, the length of time required for an application varying from three hours forty-five minutes with the six-inch irrigation, to seven hours thirty minutes with the twelve-inch irrigation. Three check plats were used to prevent as far as possible any error due to variation in the soil. Six-, nine-, and twelve-inch applications were given at the following stages of wilting:

1. Before plants showed need of water.
2. When plants showed need of water by dark-green color of foliage.
3. When plants showed need of water by dark-green color of foliage and drooping leaves.

The checks were irrigated with nine-inch applications at the first stage of wilting. The alfalfa was harvested at the beginning of growth of the basal shoots from the crowns of the plants, or in the early bloom. Two cuttings were made each year of the experiment, the first cutting early in July and the second early in September. Samples representing the two cuttings from each plat were selected for determination of moisture and nitrogen content.

In this experiment a study was made of the depth of application, total irrigation, water and nitrogen content of plant, proportion of leaves to stems, yield per acre, and yield per acre-foot of water, in relation to the different stages of wilting, the results of which are included in the following table:

IRRIGATION OF ALFALFA
Average Results for the Four-Year Period, 1915-1918

<i>Depth of application, inches</i>	<i>Total irrigation, inches</i>	<i>Total water content, per cent</i>	<i>Nitrogen, per cent</i>	<i>Proportion of leaves, per cent</i>	<i>Yield per acre, tons</i>	<i>Yield per acre-foot of water, tons</i>
Irrigated Before Plants Showed Need of Water						
6	66	84.2	3.04	36.45	6.00	1.21
9	65	86.0	3.30	35.91	5.81	1.18
12	81	81.4	3.32	37.38	6.18	1.03
Irrigated When Plants Showed Need of Water by Dark-Green Color of Foliage						
6	42	78.6	3.38	40.20	5.59	1.67
9	45	81.2	3.55	40.54	5.45	1.61
12	54	77.8	3.99	38.49	5.43	1.57
Irrigated When Plants Showed Need of Water by Dark-Green Color of Foliage and Drooping Leaves						
6	22	78.8	3.45	44.27	4.08	2.23
9	32	77.5	3.79	41.46	4.42	1.78
12	33	72.8	3.16	38.55	4.86	1.93

In the average results of the first three plats which were irrigated before plants showed need of water, a total irrigation of 70 inches produced 5.99 tons of alfalfa per acre; and of the second stage of wilting, a total irrigation of 47 inches produced 5.49 tons per acre. The average increase in yield of 0.5 tons per acre was secured by an additional use of 23 inches, which was at the rate of 0.25 tons per acre-foot of water. In the last stage of wilting an average total irrigation of 29 inches produced a yield of 4.45 tons per acre. The above results indicate that alfalfa cannot be allowed to reach the wilting point without seriously lowering its production, but that good returns may be secured when water is withheld until the plants turn dark-green in color.

Most Economical Depth of Irrigation.

The most economical use of water with alfalfa was accomplished with a total irrigation of 3.5 feet applied when plants showed need of water by dark-green color of foliage, producing 5.59 tons per acre, or at the rate of 1.67 tons per acre-foot of water. The use on this plat was equivalent during the period of irrigation to a delivery of water at the rate of one second-foot for 85 acres, or 0.47 miner's inch per acre.

The greatest total irrigation of 81 inches of water was accompanied

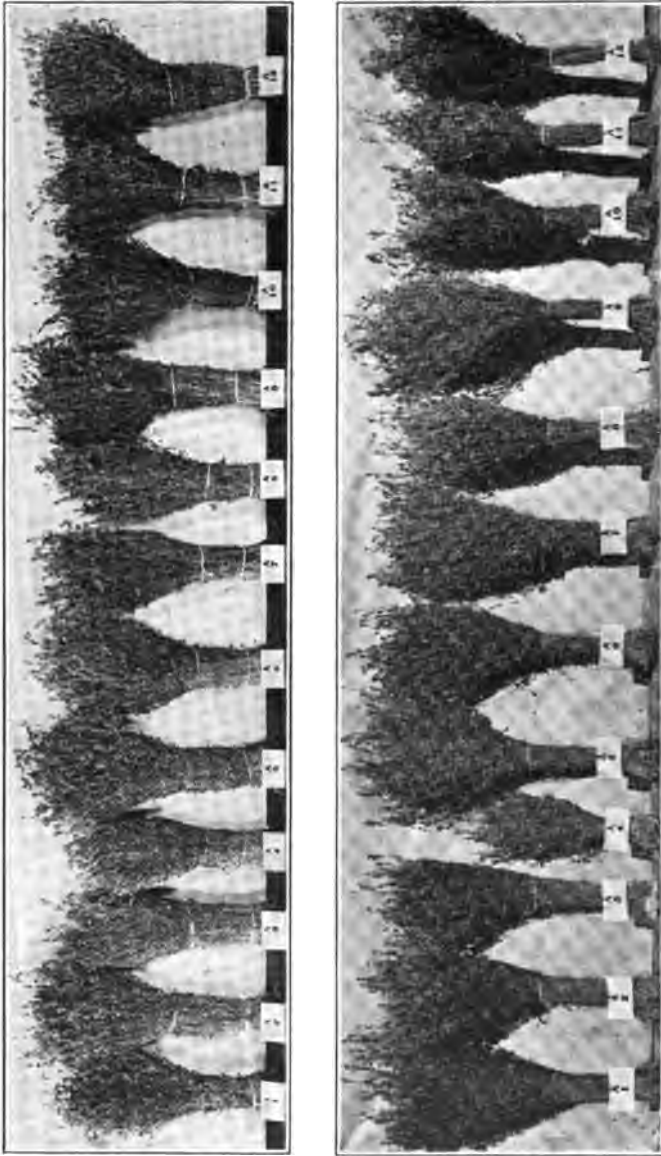


Plate 10—Variation in height of alfalfa with different methods of irrigation. Above, first crop; below, second crop. Plats 2, 5, and 9 irrigated before plants were allowed to show need for water, with *, 9-, and 12-inch applications, respectively. Plats 3, 6, and 10 irrigated when plants showed need of water by dark-green color of foliage, with 6-, 9-, and 12-inch applications, respectively. Plats 4, 8, and 11, irrigated when plants showed need of water by dark-green color of foliage and drooping leaves, with 6-, 9-, and 12-inch applications, respectively.

by the highest yield of 6.18 tons of alfalfa per acre and the lowest yield of 1.03 tons per acre-foot of water. Compared with the yield of 5.59 tons per acre the increase of 0.6 ton was obtained at the expense of an additional use of 39 inches of water which was at the rate of 0.18 ton per acre-foot. The lowest total irrigation of 22 inches gave the highest yield of 2.23 tons per acre-foot of water, but the lowest yield of 4.08 tons per acre.

Relation of Soil Moisture Content to Time and Amount of Irrigation.

Soil moisture samples were taken before the first irrigation and at harvest of the second crop. The samples were taken to a depth of four

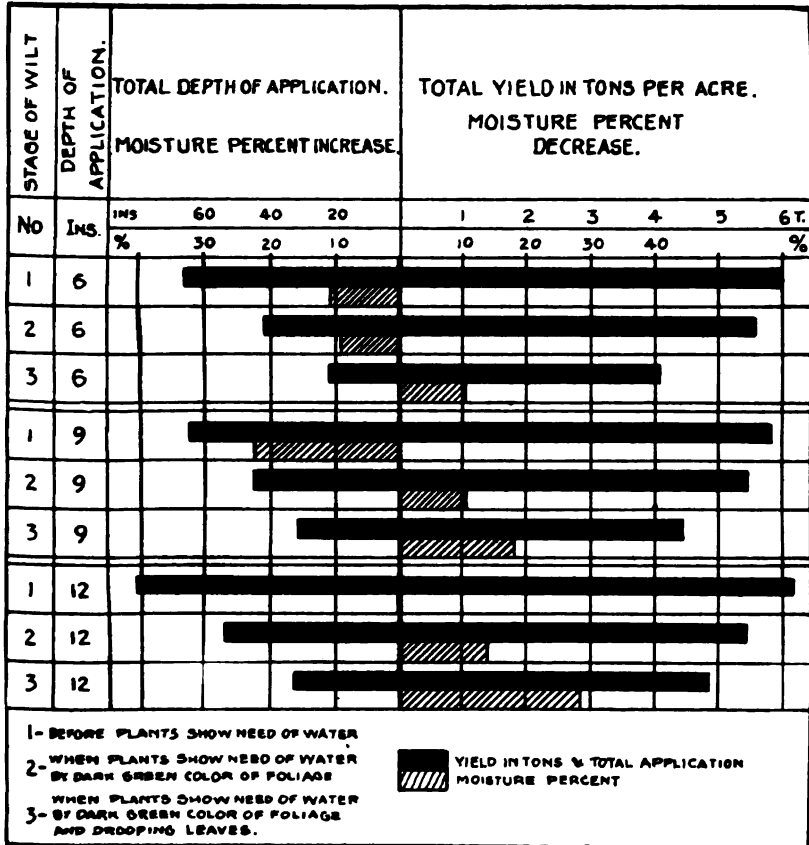


Plate 11—Irrigation of Alfalfa. Average results for the four-year period, 1915-1918, showing effect of irrigation on soil moisture.

feet and the borings from three different places on each plat were consolidated to insure a representative sample. During the year 1918 samples were taken before and after each irrigation in the manner above indicated. Experiments were also conducted to determine the weight per cubic foot and water-holding capacity of the surface foot in each plat. The following table compares the soil moisture contents before the first irrigation and before the second cutting of alfalfa at different stages of wilting, with six-, nine-, and twelve-inch applications.

IRRIGATION OF ALFALFA

Comparing the Per Cent of Decrease in Soil Moisture Content Before Harvest and Before the First Irrigation for the Four-Year Period, 1915-1918

	<i>Before plants showed need of water, per cent</i>	<i>When plants showed need of water by dark-green color of foliage, per cent</i>	<i>When plants showed need of water by dark-green color of foliage and drooping leaves, per cent</i>
<i>Six-inch Applications—</i>			
Total Irrigation, inches.....	66.00	42.00	22.00
Yield per acre, tons.....	6.00	5.59	4.08
Yield per acre-foot of water, tons.....	1.21	1.67	2.23
Average per cent of decrease in soil moisture at harvest.....	10.70*	9.10*	10.00*
<i>Nine-inch Applications—</i>			
Total Irrigation, inches.....	65.00	45.00	32.00
Yield per acre, tons.....	5.81	5.45	4.42
Yield per acre-foot of water, tons.....	1.18	1.61	1.78
Average per cent of decrease in soil moisture at harvest.....	22.10*	10.40	18.30
<i>Twelve-inch Applications—</i>			
Total Irrigation, inches.....	81.00	54.00	33.00
Yield per acre, tons.....	6.18	5.43	4.86
Yield per acre-foot of water, tons.....	1.03	1.57	1.93
Average per cent of decrease in soil moisture at harvest.....	0.00	14.00	28.20

*Average per cent of increase in soil moisture content at harvest.

An increase in soil moisture content at harvest is noted with six-inch applications in the first two stages of wilting and with nine-inch applications in the first stage, due in part to the frequency of irrigation. The greatest increase of 22.1 per cent is noted in the first stage of wilting with nine-inch applications and a total irrigation of sixty-five inches.

The most uniform decrease in moisture content at harvest is noted in the third or last stage of wilting. Here the total irrigation and yield per acre increase as the decrease in moisture content at harvest and the depth of application become greater. Generally the decrease in soil moisture content at harvest was greatest with the nine- and twelve-inch applications.

During the season of 1918 soil moisture determinations were made just before and within forty-eight hours after each irrigation, to determine the amount of water actually retained in the first four feet of soil, the results of which are given in the following table:

IRRIGATION OF ALFALFA

Average Soil Moisture Content Before and After Irrigation in 1918

<i>Depth of irrigation inches</i>	<i>Soil moisture content</i>			<i>Amount of irrigation retained in upper 4 feet</i>	
	<i>Before irrigation, per cent</i>	<i>After irrigation, per cent</i>	<i>Increase, per cent</i>	<i>Inches</i>	<i>Per cent</i>
<i>Irrigated Before Plants Showed Need of Water</i>					
6	12.6	16.8	4.2	3.00	50.0
9	15.6	19.3	3.7	2.52	28.0
12	14.2	18.4	4.2	3.00	25.0
<i>Irrigated When Plants Showed Need of Water by Dark-Green Color of Foliage</i>					
6	11.1	17.0	5.9	4.20	70.0
9	11.7	18.2	6.5	4.60	51.0
12	12.7	18.4	5.7	4.05	33.7
<i>Irrigated When Plants Showed Need of Water by Dark-Green Color of Foliage and Drooping Leaves</i>					
6	10.3	16.1	6.3	4.55	75.8
9	9.7	16.8	7.1	5.09	56.0
12	9.4	17.0	7.6	5.40	45.0

This table gives the results of work for one year only, which cannot be considered as conclusive; however, they bear out the statements previously made. When alfalfa was irrigated before the plants showed need of water, about three inches of water of each application were held in the first four feet of soil. This amounts to one-half of a six-inch, one-third of a nine-inch, and one-fourth of a twelve-inch irrigation, the remainder of the water being lost by evaporation or percolation beyond the root zone.

The total amounts of water held in the soil were greatest with the last two stages of wilting. In each case a larger part of the six-inch application was retained than of the nine- or twelve-inch applications.

The high percentage of the six-inch irrigation retained in the second stage of wilting, or when plants showed need of water by dark-green color of foliage, accompanied by the high yield per acre and yield per acre-foot of water, indicates that this was the most economical use of water with alfalfa.

IRRIGATION OF WHEAT

The irrigation experiment with wheat was conducted during the five-year period, 1914–1918, and included sixty plats, each 22 feet wide by



Plate 12—Irrigation of Wheat. Trimming the plats before harvest.

165 feet long. The plats were separated by levees four feet wide and high enough to prevent any overflow from one plat to another. Marquis wheat, used in this experiment, was treated each year for smut, and sown during the early part of April about two inches deep with a double-disk drill, using approximately seventy-five pounds of seed per acre. The wheat was irrigated by means of furrows placed at intervals of three feet. The water was measured into each plat through three pipes, one hour and seven minutes being required for a three-inch application, and a proportionate increase in time for the larger applications. Every third plat was a check.

Three-, five-, and seven-inch applications were given at the following stages of growth:

- | | | |
|---------------|-----------|-----------|
| 1. Five-leaf. | 3. Bloom. | 5. Dough. |
| 2. Boot. | 4. Milk. | |

Also six-, nine- and twelve-inch applications were given before and after heading.

In this test a comparison was made of the plats receiving an irrigation at each of the five stages of growth; with plats in which an irrigation was omitted at each of the five stages; with plats in which irrigations

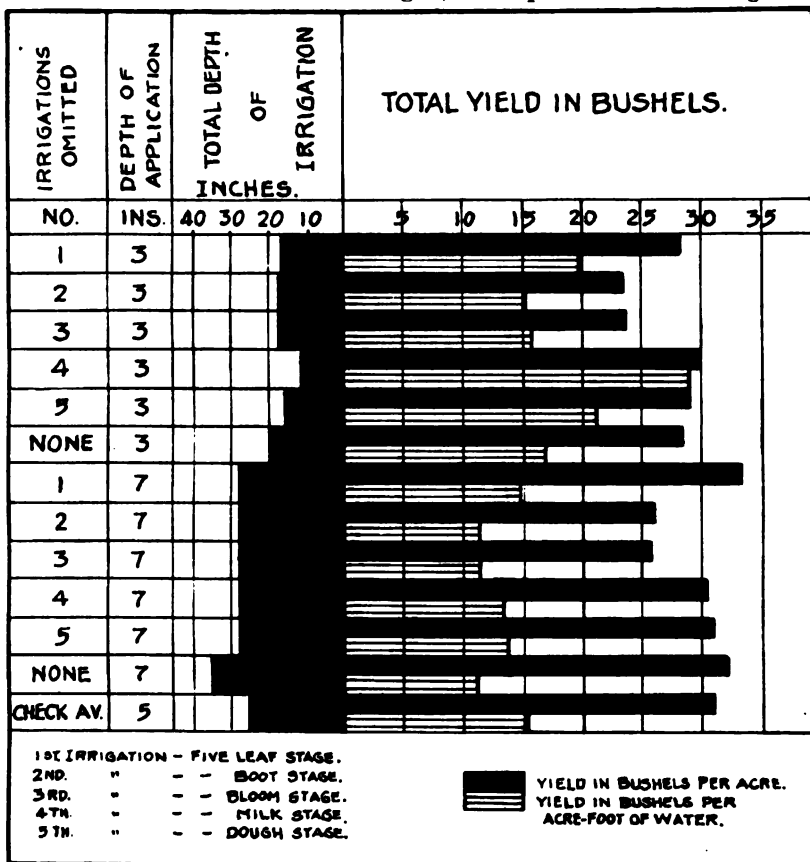


Plate 13—Irrigation of Wheat. Average results with four applications, for the five-year period, 1914-1918, showing effect of irrigation on yield per acre and yield per acre-foot of water.

were omitted at any two stages of growth; and with plats that received the same amounts of water in two applications only, one before and one after heading. The principal objects of the experiment were to determine the best depths of irrigation and the critical stages in the growth of the wheat crop.

The wheat plats were harvested in early August with a grain binder. The plats that received only three applications with a small total irrigation were the first to reach maturity. The wheat was threshed with

a small thresher operated by a six-horsepower gasoline engine. This machine made possible the thorough cleaning of the wheat with practically no loss in threshing.

Results with Four Applications.

The following table gives the results with three- and seven-inch applications when one irrigation was omitted at each of the different stages of growth, and the increase of seven-inch over the three-inch applications:

IRRIGATION OF WHEAT			
<i>Average Yields for the Five-Year Period, 1914-1918</i>			
<i>One irrigation omitted at—</i>	<i>Three-inch applications, bushels</i>	<i>Seven-inch applications, bushels</i>	<i>Average increase, per cent</i>
Five-leaf stage.....	28.1	33.3	18.5
Boot stage.....	23.4	26.2	11.9
Bloom stage.....	23.7	25.9	9.3
Milk stage.....	29.8	30.4	2.1
Dough stage.....	29.1	31.0	6.5
No irrigation omitted.....	28.4	32.2	13.4

These results are in favor of the seven-inch applications, the highest yield being obtained when an irrigation was omitted at the five-leaf stage. This yield of 33.3 bushels, is 18.5 per cent higher than the corresponding yield with three-inch applications, and four per cent greater than the yield of 32.2 bushels when no irrigations were omitted and a total of thirty-five inches of water was applied. With both three- and seven-inch applications the lowest yields are recorded when an irrigation was omitted at the boot or bloom stage. The results indicate that an irrigation may be omitted at the five-leaf, milk or dough stage without materially decreasing the yield of grain, but that an application omitted at the boot or bloom stage seriously interferes with the proper growth of the crop. The high yield of 33.3 bushels may be attributed to the greater development of root system with the first irrigation omitted and at the same time the plants did not suffer for lack of sufficient moisture before the irrigation at the boot stage.

Results with Three Applications.

The following table gives the average results with three- and seven-inch applications and with two irrigations omitted at the different stages of growth:

IRRIGATION OF WHEAT			
<i>Average Yields for the Five-Year Period, 1914-1918</i>			
<i>Two irrigations omitted at—</i>	<i>Three-inch applications, bushels</i>	<i>Seven-inch applications, bushels</i>	<i>Average increase, per cent</i>
Five-leaf and boot.....	15.9	20.4	28.3
Five-leaf and bloom.....	21.2	23.9	12.7
Five-leaf and milk.....	27.1	28.2	4.1
Five-leaf and dough.....	27.6	31.0	12.3
Boot and bloom.....	13.8	19.5	41.3
Boot and milk.....	21.2	23.5	10.8
Bloom and milk.....	23.2	23.8	2.6
Bloom and dough.....	24.8	28.8	16.1
Milk and dough.....	29.0	30.5	5.2
No irrigations omitted.....	28.4	32.2	13.4

The results here are also in favor of the seven-inch applications, although the variation in yield was more pronounced, especially between the three-inch and seven-inch applications. The highest yield was

lowest yield of 19.5 bushels with seven-inch applications was obtained with irrigations omitted at the boot and bloom stages.

With three-inch applications the highest yield was obtained when irrigations were omitted at the milk and dough periods. High yields were also obtained when irrigations were omitted at the five-leaf and milk and five-leaf and dough stages. The lowest yield was obtained when applications were omitted at the boot and bloom periods, the yield in this case being 53 per cent lower than the highest yield with three-inch applications. The other low yields correspond generally to the low yields with seven-inch applications.

The high yields obtained with seven-inch applications when irrigations were omitted at the five-leaf and milk, five-leaf and dough, and milk and dough stages indicate that irrigations omitted at any two of these stages have the least effect in lowering the yield of wheat.

The low yields with both three-inch and seven-inch applications when irrigations were omitted at the boot and bloom stages indicate that a very critical period in the irrigation of wheat is between the boot and the milk stages.

Yield Per Acre-Foot of Water with Three and Four Irrigations and Three- and Seven-Inch Applications.

The following table gives a comparison of the yields per acre and yield per acre-foot of water with three and four irrigations and three- and seven-inch applications:

IRRIGATION OF WHEAT
Average Results for the Five-Year Period, 1914-1918

	<i>Three-inch applications</i>			<i>Seven-inch applications</i>		
	<i>Total irrigation, inches</i>	<i>Yield per acre, bushels</i>	<i>Yield per acre-foot of water, bushels</i>	<i>Total irrigation, inches</i>	<i>Yield per acre, bushels</i>	<i>Yield per acre-foot of water, bushels</i>
<i>One irrigation omitted at—</i>						
Five-leaf stage.....	17	28.1	19.6	28	33.3	14.8
Boot stage.....	18	23.4	15.1	28	26.2	11.7
Bloom stage.....	18	23.7	15.8	28	25.9	11.4
Milk stage.....	12	29.8	29.1	28	30.4	13.4
Dough stage.....	16	29.1	21.3	28	31.0	13.8
No irrigations omitted.....	21	28.4	16.9	35	33.2	11.2
<i>Two irrigations omitted at—</i>						
Five-leaf and boot.....	13	15.9	15.3	21	20.4	12.1
Five-leaf and bloom.....	13	21.2	20.5	21	23.9	14.1
Five-leaf and milk.....	10	27.1	33.7	21	28.2	16.5
Five-leaf and dough.....	12	27.6	27.9	21	31.0	18.3
Boot and bloom.....	12	13.8	13.5	21	19.5	11.5
Boot and milk.....	9	21.2	27.3	21	23.5	13.8
Bloom and milk.....	9	23.2	30.3	21	23.8	14.0
Bloom and dough.....	12	24.8	26.4	21	28.8	16.9
Milk and dough.....	9	29.0	38.3	21	30.5	17.9
Average of checks.....				25	31.0	15.3

Note—Where a three-inch application failed to irrigate the entire plot, sufficient additional water was applied, accounting for the slight irregularity shown in the average total irrigation.

With a total irrigation of 28 inches of water given in four applications and an irrigation omitted at the five-leaf stage, the highest yield of 33.3 bushels per acre was accompanied by the highest yield of 14.8 bushels per acre-foot of water.

With seven-inch applications the highest yield of 18.3 bushels per acre-foot of water with a total irrigation of 21 inches was produced

where irrigations were omitted at the five-leaf and dough stages and the lowest yield of 11.1 bushels per acre-foot of water with a total irrigation of 35 inches. With three-inch applications the greatest yield of 38.3 bushels per acre-foot of water was obtained with irrigations omitted at the milk and dough stages, and the lowest yield of 13.5 bushels per acre-foot of water with irrigations omitted at the boot and bloom stages.

Results with Two Irrigations.

The following table compares the yields of wheat per acre and yields per acre-foot of water where only two irrigations were given and different depths of applications used before and after heading:

IRRIGATION OF WHEAT			
<i>Average Results for the Five-Year Period, 1914-1918</i>			
<i>Depth of irrigation</i>			
<i>Before heading, inches</i>	<i>After heading, inches</i>	<i>Yield per acre, bushels</i>	<i>Yield per acre-foot of water, bushels</i>
6	6	26.5	26.5
6	9	25.7	20.6
6	12	25.8	17.1
9	6	23.5	18.8
9	9	20.1	19.3
9	12	26.0	14.9
12	6	25.1	16.7
12	9	25.3	14.5
12	12	26.4	13.2

Where only two irrigations were given, the two nine-inch applications, one before and one after heading, produced the greatest yield of 29.1 bushels per acre, or 14.4 per cent less than the highest yield with 28 inches of water in four seven-inch applications. The twelve-inch irrigation before heading apparently provided more water than the crop utilized to best advantage. The maximum yield with two irrigations was obtained with a total of 18 inches of water applied when the crop turned dark green in color. With a total irrigation of less than 18 inches the yield was considerably decreased; whereas, a total irrigation of twenty-four inches in two twelve-inch applications produced an average of 26.4 bushels per acre or about ten per cent less than where the two nine-inch applications were used.

Yield Per Acre-Foot of Water with Two Irrigations.

The highest yield of 26.5 bushels per acre-foot of water was obtained with the smallest total irrigation of twelve inches, and the lowest yield of 13.2 bushels per acre-foot of water with the largest total irrigation of 24 inches. The third highest yield of 19.3 bushels per acre-foot of water was produced with the two nine-inch applications, indicating that this was the most economical use of water with wheat when only two applications were given.

With only two irrigations the yields were generally lower throughout than with a greater number of applications using the same total amount of water. It is therefore recommended that only in cases of water shortage is it advisable to use only two irrigations in preference to three or four applications, as shown in the results of these experiments where the yields of grain are generally much higher. It should be noted, however, that with only two irrigations possible, a profitable crop of wheat may be grown.

Relation of Soil Moisture Content to Time and Amount of Irrigation.

Soil moisture samples were taken at regular intervals each year during the period of irrigation to determine the variation in moisture content in relation to the time of irrigation and the depth of application.

Soil Moisture Contents with One Irrigation Omitted.

The following table gives a comparison of the soil moisture contents before the first irrigation and at harvest with three-inch and seven-inch applications and one irrigation omitted.

IRRIGATION OF WHEAT

Average Per Cent of Decrease in Soil Moisture Content at Harvest for the Five-Year Period, 1914-1918

Irrigation omitted at—	Three-inch applications		Seven-inch applications	
	Decrease, per cent	Yield per acre, bushels	Decrease, per cent	Yield per acre, bushels
None.....	11.0	28.4	6.8	32.2
Five-leaf stage.....	19.0	28.1	0.5*	33.3
Boot stage.....	17.2	23.4	2.4*	26.2
Bloom stage.....	0.5	23.7	9.9*	25.9
Milk stage.....	8.3	29.8	2.7*	30.4
Dough stage.....	26.6	29.1	14.4	31.0

*Average per cent of increase of soil moisture content at harvest.

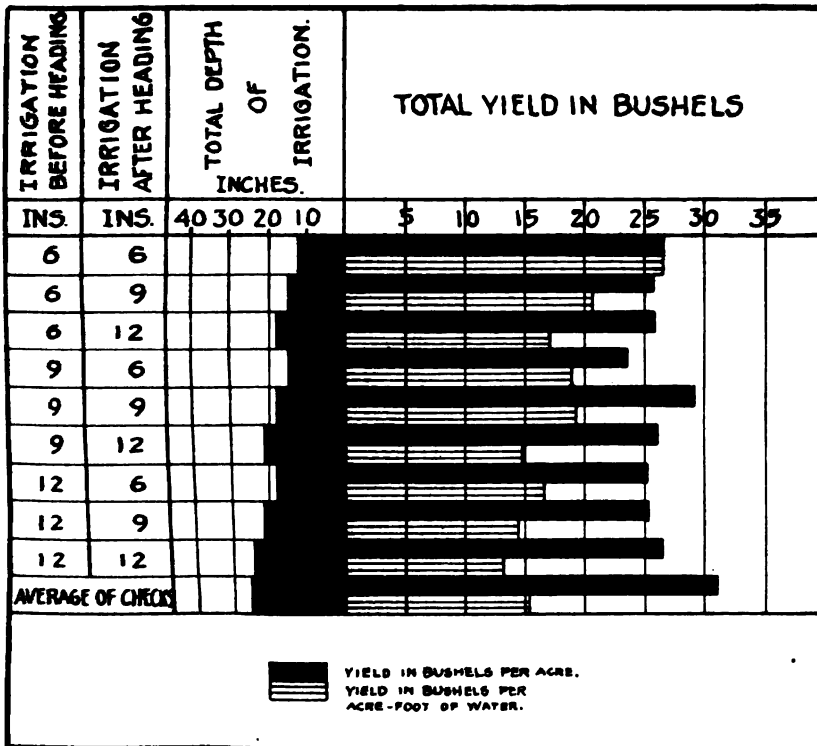


Plate 15—Irrigation of Wheat. Average results with two applications for five-year period, 1914-1918, showing effect of irrigation on yield per acre and yield per acre-foot of water.

These results show that the high yields per acre are generally accom-

panied by the greatest decrease in soil moisture at harvest as compared with the soil moisture content before the first irrigation. With three-inch applications the smallest decrease in soil moisture content at harvest, with an irrigation omitted at the bloom stage, was accompanied by the low yield of 23.7 bushels per acre, or 23 per cent less than the yield with one irrigation omitted at the dough stage.

With seven-inch applications the greatest increase in soil moisture content at harvest was obtained when an irrigation was omitted at the bloom stage, the yield being 25.9 bushels per acre, or 20 per cent less than the highest yield.

The omission of an irrigation at the bloom stage seriously checked the development of the wheat crop and prevented the plants from utilizing the moisture in the soil to the best advantage during the later periods of growth.

Soil Moisture Contents with Two Irrigations Omitted.

The following table gives a comparison of soil moisture contents before the first irrigation and at harvest with three-inch and seven-inch applications, and with two irrigations omitted :

IRRIGATION OF WHEAT
Average Per Cent of Decrease in Soil Moisture Content at Harvest for the Five-Year Period, 1914-1918

<i>Two irrigations omitted—</i>	<i>Three-inch applications</i>		<i>Seven-inch applications</i>	
	<i>Decrease, per cent</i>	<i>Yield per acre, bushels</i>	<i>Decrease, per cent</i>	<i>Yield per acre, bushels</i>
Five-leaf and boot.....	13.2	15.9	2.5	20.4
Five-leaf and bloom.....	2.1	21.2	10.1*	23.9
Five-leaf and milk.....	17.4	27.1	4.8	28.2
Five-leaf and dough.....	9.5	27.6	4.7	31.0
Boot and bloom.....	1.5	13.8	0.0	19.5
Boot and milk.....	9.5	21.2	7.3	23.5
Bloom and milk.....	15.2	23.2	6.4*	23.8
Bloom and dough.....	19.6	24.8	0.0	28.8
Milk and dough.....	24.9	29.0	11.7	30.5

*Average per cent of increase in soil moisture content at harvest.

It is noted in these results that with the three-inch applications the smallest decrease in soil moisture content at harvest was obtained with irrigations omitted at the boot and bloom stages, and accompanied by the lowest yield of 13.8 bushels per acre. The next lowest decrease in soil moisture content at harvest occurred with irrigations omitted at the five-leaf and bloom stages, accompanied by a comparatively low yield of 21.2 bushels per acre.

With the seven-inch applications it is interesting to note that where no decrease or where an increase is shown in the soil moisture content at harvest, one of the irrigations omitted in each instance was at the bloom stage. The average yield of these four plats was 24.0 bushels per acre, or 29.2 per cent less than the highest yield with one irrigation omitted at the five-leaf stage. This confirms the previous statement that an irrigation omitted between the boot and milk stages may seriously check the proper development of the crop.

IRRIGATION OF POTATOES

The irrigation experiment with potatoes included nineteen plats of four rows each. The potatoes were planted the last of May each year in rows three feet apart and about fourteen inches apart in the row. The potatoes were irrigated by means of comparatively deep furrows

three feet apart. Three-, six-, and nine-inch applications of water were at the following stages of growth:

1. Before plants showed a tendency to wilt.
2. When plants showed a tendency to wilt.
3. When leaves wilted down once.
4. When plants failed to revive at night.

The crop was harvested each year about the first of October. Of the four rows in each plat the two outside rows were eliminated to prevent as far as possible any variation due to seepage from adjoining plats. Three hills in different parts of each plat were selected for a determination of the starch content.¹



Plate 16—Irrigating a field of Nevada potatoes.

The following table gives the average results on total irrigation, water content, starch content, yield per acre and yield per acre-foot of water:

IRRIGATION OF POTATOES					
<i>Average Results for the Four-Year Period, 1914-1917</i>					
<i>Depth of irrigation, inches</i>	<i>Total irrigation, inches</i>	<i>Water content, per cent</i>	<i>Starch content, per cent</i>	<i>Yield per acre, pounds</i>	<i>Yield per acre-foot of water, pounds</i>
Irrigated before plants were allowed to wilt					
3	22.5	76.7	68.3	15,333	8,022
6	28.5	76.4	65.4	10,577	4,530
9	38.2	77.3	68.3	13,402	4,239
Irrigated when plants showed a tendency to wilt					
3	16.5	78.4	64.4	15,977	12,025
6	19.5	77.3	63.2	9,597	5,730
9	27.0	77.2	65.2	9,175	6,593
Irrigated when plants wilted down once					
3	10.5	78.4	56.2	9,665	14,036
6	13.5	78.5	62.4	9,849	9,172
9	18.0	76.1	64.8	7,786	6,819

¹The starch content was determined by means of direct acid hydrolysis. See page 53, Bulletin 107, Bureau of Chemistry, U. S. Department of Agriculture.

Irrigated when plants failed to revive at night					
3	6.0	78.7	59.3	5,825	11,958
6	7.5	78.4	58.8	5,525	10,571
9	9.0	78.6	59.8	3,593	4,464
Average of checks—					
6	24.0	76.8	66.9	9,753	4,858

The yield of potatoes in 1915 was materially decreased by dry rot, and in 1916 by an unfavorable season. However, all plats appeared to be equally affected; thus the comparative results are about as valuable as with greater production. The results showed that with the three-, six-, and nine-inch applications, the average total irrigation, the starch

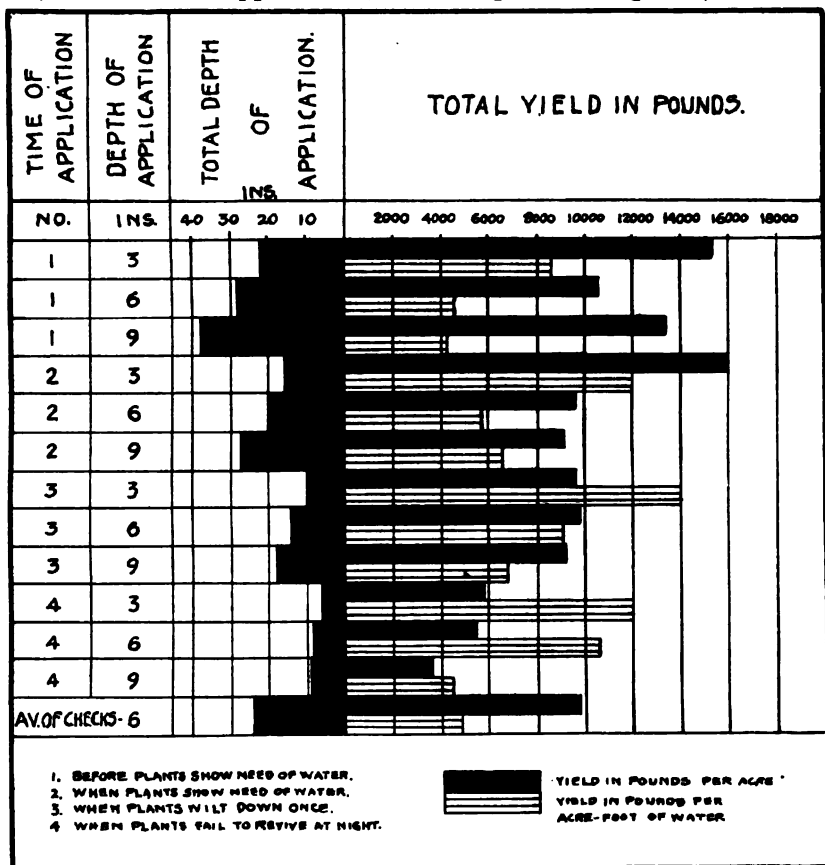


Plate 17—Irrigation of Potatoes. Average results for the four-year period, 1914-1917, showing the effect of irrigation on yield and yield per acre-foot of water.

content, and the yield per acre decreased with the advance in the wilting stage, while the yield per acre-foot of water increased, except in the last wilting stage, where a considerable decrease is noted with nine-inch applications.

The best average results were generally obtained with the three-inch applications at the different stages of wilting. For the four-year period,

the highest yield of 15,977 pounds per acre was obtained with an average total irrigation of 16.5 inches with three-inch applications given when the plants showed a tendency to wilt, and the yield per acre-foot of water was 12,025 pounds. The next best yield of 15,333 pounds per acre was secured with eight three-inch applications given before plants showed a tendency to wilt, although the yield per acre-foot of water was only 8,622 pounds per acre. Where the plants wilted down before irrigation, the potatoes made a second growth which resulted in lowering the yield per acre and starch content of the potatoes. The proportion of scabby potatoes was greatly increased in those plats which received a total irrigation of twenty-four inches or more of water.

General Statement.

The potato rows should be hilled up with good deep furrows between them, so that, when irrigated, the water will supply the deep-feeding roots, but will not come in contact with the tubers.

A too common error with the potato grower is the use of shallow furrows for carrying the water. The chief danger is in saturating the ground around the tubers, causing the soil to become hard and compact, a very undesirable condition for the development of a good hill of uniform potatoes. It is thus very important to use light irrigations in good deep furrows.

The potato crop should never be irrigated by means of flooding,

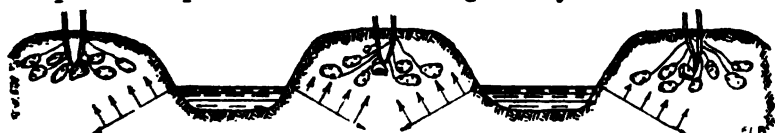


Plate 18—The proper method of irrigation for potatoes.

since this method causes the soil to pack around the tubers and prevents the ground from receiving sufficient water for the need of the plants.

The potato crop is very sensitive to an excess of moisture in the soil. Most of the failures in potato growing in this State have occurred on the heavy lands and have been due chiefly to this one cause. Soils which contain an excess of water are too cold for the proper development of the potato and offer conditions favorable to the formation of scab and rot. Most of the soils on the Experiment Station Farm are too heavy and too level for good results with potatoes. It is noted above that the most practical method of irrigation was by the use of light applications when the plants had turned dark-green in color. At the time of harvest this ground turns up in large clods unless irrigated immediately before digging. This condition indicates that the ground has packed too firmly for the proper development of uniform marketable potatoes. Such lands are made more porous by a heavy application of lime or gypsum, but the potatoes are liable to be badly affected with scab, as is the case when fresh manure is used in large quantities. Many growers overcome this objection on heavy soils by planting the potatoes on land with a considerable slope. Here the drainage is good and there is less danger that the soil will remain too wet.

For the best results with potato growing, well-drained land is essential, and only moderate applications of water should be given the crop when needed.

The following table gives a comparison of soil moisture content with

potatoes before the first irrigation and before harvest, at different stages of wilting, with three-, six-, and nine-inch applications:

IRRIGATION OF POTATOES

Average Per Cent of Decrease in Soil Moisture Content Before Harvest for the Four-Year Period, 1914-1917

<i>Soil samples taken</i>	<i>Three-inch applications</i>	<i>Six-inch applications</i>	<i>Nine-inch applications</i>
Irrigated before plants showed tendency to wilt			
Before first irrigation.....	20.6	19.8	19.0
Before harvest.....	19.5	18.9	19.8
Per cent decrease.....	5.3	4.5	4.2*
Irrigated when plants showed tendency to wilt			
Before first irrigation.....	18.7	20.5	18.6
Before harvest.....	18.0	18.1	17.8
Per cent decrease.....	3.7	11.7	4.3
Irrigated when leaves wilted down once			
Before first irrigation.....	18.8	16.9	19.8
Before harvest.....	17.6	17.2	16.6
Per cent decrease.....	6.5	1.8*	16.1
Irrigated when plants failed to revive at night			
Before first irrigation.....	19.3	18.9	18.4
Before harvest.....	16.5	15.1	16.9
Per cent decrease.....	14.5	20.1	8.2

*Average per cent of increase in soil moisture content at harvest.

With the three-inch irrigations at the different stages of wilting the soil moisture contents before harvest were slightly less than before the first irrigation. This decrease is most evident in the last stage of wilting with 14.5 per cent.

With the six-inch applications an increase is shown in the third stage of wilting, while in the other three stages the soil moisture content at harvest was less than before the first irrigation, amounting to a decrease of 20.1 per cent in the last stage of wilting.

With the nine-inch irrigations a decrease was shown in the last three stages of wilting, amounting to 16.1 per cent where irrigated when leaves wilted down once; while a slight increase occurred when irrigations were given before plants showed a tendency to wilt.

Where the heaviest yield of 15,977 pounds per acre was produced with a total irrigation of 17 inches of water in three-inch applications, given when the plants first showed a tendency to wilt, the soil moisture content before harvest was only 3.7 per cent less than before the first irrigation. This heavy yield was accompanied by the second highest yield of 12,025 pounds per acre-foot of water.

Where the lowest yield of 3,593 pounds per acre was produced with one nine-inch application at the last wilting stage, the soil moisture content at harvest was 8.2 per cent less than before the first irrigation. Moreover, the yield per acre-foot of water was only 4,464 pounds as compared with 12,025 pounds for the highest yield and 17 inches total irrigation.

No uniform variations occurred in soil moisture content with potatoes as were found with alfalfa in the various stages of wilting and with different depths of application.

IRRIGATION OF CLOVER

The irrigation experiment with clover (Common Red) in 1914 was conducted on a sandy clay soil with a gravelly subsoil, and included

twelve plats, each 10 feet wide and 264 feet long. The clover was planted in the spring of 1913 with a nurse crop of wheat, and produced one crop of hay that season after the wheat had been harvested. The plats were separated by levees four feet wide and high enough to prevent any overflow of water from one plat to another.

In the irrigation of clover, six-, nine-, and twelve-inch applications were given at the following stages of wilting:

1. Before plants showed need of water.
2. When plants showed need of water by dark-green color of foliage.
3. When plants showed need of water by dark-green color of foliage and drooping leaves.

During the season of 1914 two crops of hay were harvested on June 16, and August 5, respectively. Samples of hay were selected from each plat with the two cuttings for a determination of nitrogen content.¹

The following table gives the depth of application, total irrigation, nitrogen content and yield per acre-foot of water:

IRRIGATION OF CLOVER—1914

<i>Depth of application, inches</i>	<i>Total irrigation, inches</i>	<i>Nitrogen content, per cent</i>	<i>Yield per acre, tons</i>	<i>Yield per acre-foot of water, tons</i>
Irrigated before plants showed need of water				
6	36	2.32	4.45	1.48
9	42	2.19	5.52	1.58
12	57	1.81	6.97	1.47
Irrigated when plants showed need of water by dark-green color of foliage				
6	24	2.29	3.58	1.79
9	36	2.32	3.51	1.17
12	36	2.13	4.08	1.36
Irrigated when plants showed need of water by dark-green color of foliage and drooping leaves				
6	24	2.56	2.71	1.35
9	36	2.28	3.16	1.05
12	36	2.11	3.38	1.13
Average of checks—				
6	36	2.32	4.49	1.50

Results.

The results show that clover cannot be allowed to reach the wilting stage without materially decreasing the yield of hay: also, that in these experiments applications of from nine to twelve inches given before the plants showed need of water gave the heaviest production of hay. However, where the total yield was greatest, the yield per acre-foot of water was low and the quality of hay inferior to that of other plats, due to the large proportion of coarse stems to leaves. The importance of the time of application of water is well illustrated in the results, since a gradual decrease in yield occurred in the different plats with the same applications of water, as the wilting stage advanced, before water was applied. Clover responded more readily to the heavy applications of water than any other crop.

The lowest nitrogen content is noted with the greatest total irrigation and the highest yield per acre. With this exception no uniform variation occurred in the nitrogen content.

¹The nitrogen content was determined by the official method used by the Bureau of Chemistry, U. S. Department of Agriculture.

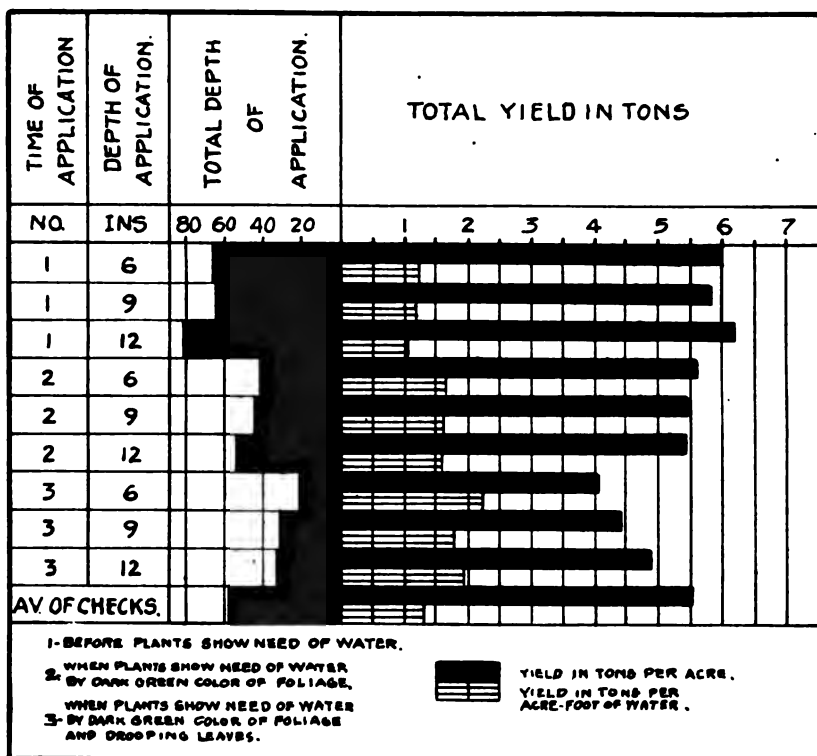


Plate 19—Irrigation of Clover. Average results 1914, showing effect of irrigation on yield per acre and piled per acre-foot of water.

SUGAR-BEETS

The irrigation experiment with sugar-beets during the two-year period, 1914-1915, included nineteen plats. Each plat consisted of four rows 165 feet long and two feet apart. The seed was planted with a hand drill, about one and one-half inches deep, at the rate of twenty pounds per acre.

In the irrigation of sugar-beets, two-, four-, and six-inch applications of water were given at the following stages of wilting:

1. Before plants showed a tendency to wilt.
2. When plants showed a tendency to wilt.
3. When leaves wilted down once.
4. When plants failed to revive at night.

When four leaves appeared on the plants, the beets were thinned to about ten inches apart in the rows. The crop received two hoeings when needed and was cultivated after each irrigation. The beets were harvested in late September with an ordinary walking beet-plow. Of the four rows in each plat, the two outside rows were eliminated as with potatoes. After plowing out the beets they were topped and weighed. Five average-sized beets from different parts of each plat were selected, weighed, and reserved for chemical analysis for sugar content and purity.¹ The following table compares the total irrigation,

¹Sugar content and purity determined by means of indirect method. See Bulletin 146, page 14, Bureau of Chemistry, United States Department of Agriculture. Digitized by Google

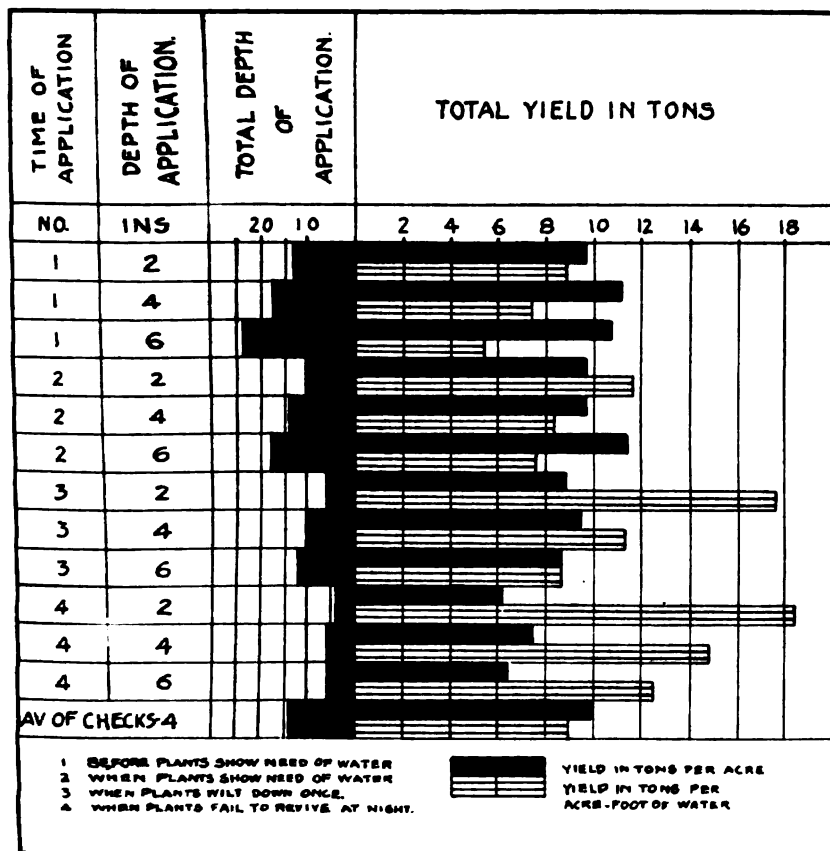


Plate 20—Irrigation of Sugar-Beets. Average results for the two-year period, 1914-1915, showing effect of irrigation on yield per acre and yield per acre-foot of water.

proportion of roots to tops, sugar content, purity, yield per acre, and yield per acre-foot of water at the different stages of wilting:

IRRIGATION OF SUGAR-BEETS						
Average Results for the Two-Year Period, 1914-1915						
Depth of application, inches	Total irrigation, inches	Proportion of roots to tops, per cent	Sugar content, per cent	Purity of beet, per cent	Yield per acre, tons	Yield per acre-foot of water, tons
Irrigated before plants showed tendency to wilt						
2	13	76.1	21.95	86.29	9.58	8.84
4	18	72.9	20.92	81.57	11.31	7.37
6	24	74.9	21.18	82.52	10.70	5.35
Irrigated when plants showed tendency to wilt						
2	10	74.1	22.91	87.34	9.64	11.58
4	14	74.0	21.48	87.12	9.67	8.30
6	18	69.5	20.60	82.20	11.43	7.62
Irrigated when plants wilted down once						
2	6	72.0	23.39	76.61	8.80	17.60
4	10	71.2	21.01	84.48	9.40	11.28
6	12	67.8	22.61	83.02	8.57	8.57

Irrigated when plants failed to revive at night						
2	4	71.8	22.44	78.78	6.12	18.36
4	6	74.2	18.59	78.53	7.38	14.76
6	6	67.0	22.67	82.57	6.27	12.54

The average results for the two years show that the sugar-beets which were irrigated after they wilted down and failed to revive at night, did not produce a profitable crop. The greatest yield of 11.43 tons was obtained with three 6-inch applications given when the plants showed a tendency to wilt, and was accompanied by a relatively low yield of 7.62 tons per acre-foot of water. The lowest yield of 6.12 tons per acre was obtained in the last stage of wilting with two-inch applications, and was accompanied by the highest yield of 18.36 tons per acre-foot of water.

Only slight variations in yield are shown with the two-inch, four-inch, and six-inch applications, and also with the total irrigations of twelve, eighteen, and twenty-four inches. This is attributed partly to the lateral diffusion of moisture from one plat to another, since the plats were such a short distance apart. The sugar content of the beet was not materially affected by the stages of wilting or by the depth of application. The purity of juice in beets varied with the different stages of wilting, being greatest in the beets which received two- and four-inch applications where the plants showed a tendency to wilt. These plats produced an average of 9.65 tons of beets per acre. The error caused by this diffusion of water from one plat to another was so great that it was deemed advisable to discontinue this investigation after the two-year period.

SUMMARY

1. The approximate area of land in the State of Nevada is 70,285.440 acres, of which 900,000 acres, or 1.3 per cent, were irrigated in 1918.

2. In 1918, Nevada produced, approximately, 145,000 acres of alfalfa, 80,000 acres of wheat, and 15,000 acres of potatoes. These are the most important cultivated crops grown under irrigation.

3. Nevada lies almost wholly within the Great Basin. The Humboldt, Truckee, Carson, Walker and Muddy are the principal rivers supplying water for irrigation. More than 50 per cent of the irrigated area in the State received its water from the Humboldt River.

4. The greater portion of the acreage of alfalfa and grain in Nevada is irrigated by the border method of flooding. The furrow method is used in the irrigation of potatoes and other similarly cultivated crops.

5. The important factors affecting duty of water in Nevada are: Type of soil, topography, hardpan near the surface, annual rainfall and evaporation. The type of soil causes greater variation in the amount of water required under general field conditions than any other one factor.

6. The average results of early investigations on the irrigation of alfalfa at the Experiment Station, 1906-1911, show a total irrigation of 3.27 acre-feet of water, producing a yield of 5.93 tons per acre, or 1.87 tons per acre-foot of water.

7. During the five-year period of Irrigation Investigations, 1914-1918, practically no precipitation was received during the growing season that was sufficient to affect the moisture content of the soil. This is a unique condition which probably has not obtained in any other irrigated section of the West.

8. In the later investigations the water was measured into each plat through calibrated galvanized iron pipes two inches in diameter. Check plats were used to prevent, as far as possible, any errors due to variation in soil.

9. Alfalfa that was allowed to reach the wilting point before irrigation produced a relatively low yield per acre, but excellent returns were realized when irrigation was withheld until the plants turned dark green in color.

10. The most economical use of water with alfalfa was accomplished with a total irrigation of 3.5 feet applied when plants showed need of water by dark-green color of foliage, producing 5.59 tons per acre, or at the rate of 1.67 tons per acre-foot of water. Soil moisture determinations showed that 70 per cent of the six-inch applications was retained in the first four feet in depth of soil. The use on this plat was equivalent during the period of irrigation to a delivery of water at the rate of one second-foot for 85 acres, or 0.47 miner's inch per acre.

11. The highest yield of 6.18 tons per acre of alfalfa was obtained with 81 inches total depth when the crop was irrigated before plants showed need of water, but this was accompanied by the lowest yield of 1.03 tons per acre-foot. Compared with the yield of 5.59 tons per acre the increase of 0.6 ton was obtained at the expense of an additional use of 39 inches of water, which was at the rate of 0.18 ton per acre-foot. Soil moisture determinations showed that only 25 per cent of the twelve-inch applications was retained in the first four feet in depth of soil.

12. In the irrigation of alfalfa the decrease in soil moisture content at harvest was generally greatest with the nine- and twelve-inch applications. The total amounts of water held in the soil were greatest with the last two stages of wilting.

13. In the irrigation of wheat during the five-year period, 1914-1918, three- and seven-inch applications were given at two or more of the five stages of growth, including, five-leaf, boot, bloom, milk and dough stages.

14. The highest yield of wheat was obtained with 28 inches of water in four applications, when an irrigation was omitted at the five-leaf stage.

15. The highest yield of wheat with three irrigations occurred with 21 inches of water when applications were omitted at the five-leaf and dough stages.

16. The average yields of wheat were considerably higher with the seven-inch than with the three-inch applications.

17. The yields of wheat were relatively low when irrigations were omitted at the boot and bloom stages, thus indicating that a very critical period in the irrigation of wheat was between the boot and milk stages.

18. The highest yield of wheat with two irrigations was secured with nine-inch applications, one before and one after heading.

19. In the irrigation of wheat the high yields per acre were generally accompanied by the greatest decrease in soil moisture content at harvest as compared with the soil moisture content before the first irrigation.

20. In the irrigation of potatoes during the four-year period, 1914-1917, the highest yield was obtained with a total irrigation of 16.5 inches in three-inch applications, given when the plants showed a tendency to wilt.

21. In the irrigation of clover in 1914, a gradual decrease in yield occurred in the different plats with the same applications of water as the wilting stage advanced, before water was applied.

22. In the irrigation of sugar-beets during the two-year period, 1914-1915, the greatest yield was obtained with 18 inches of water in three-inch applications.

23. The results of these investigations on the irrigation of field crops, show that the most economical use of water was obtained with a total irrigation of 3.5 feet in six-inch applications for alfalfa and clover; 2.3 feet in seven-inch applications for wheat; and 1.5 feet in three-inch applications for potatoes and sugar-beets. When alfalfa fields are used for fall pasture, usually an additional irrigation is required after the last crop of hay is harvested.





CARSON CITY, NEVADA

STATE PRINTING OFFICE, : JOE FARNSWORTH, SUPERINTENDENT

1919

STATE OF NEVADA

**List of Registered Automobiles and
Motorcycles from April 1 to
June 30, 1919**

SECOND QUARTERLY REPORT

Compiled by
GEORGE BRODIGAN
Secretary of State of the State of Nevada



CARSON CITY, NEVADA
STATE PRINTING OFFICE : : JOE FARNSWORTH, SUPERINTENDENT
1919

SECOND QUARTERLY REPORT OF REGISTERED AUTO- MOBILES AND MOTORCYCLES

(Compiled by GEORGE BRODIGAN)

The following pages, compiled in numerical rotation, contain names and addresses of owners who have registered their motor vehicles for the year 1919 with the Secretary of State from April 1, 1919, to June 30, 1919, inclusive, together with the number of the official license-plate issued to each for use as prescribed by law.

This form was adopted at request of some of the officials whose duties include the enforcement of the motor-vehicle laws.

LIST OF REGISTERED AUTOMOBILES FOR QUARTER ENDING JUNE 30, 1919

Make of vehicle is given last.

36661.	Kirk, Geary & Co., Reno, Ford.	36738.	Fred C. Voight, Lamoille, Oldsmobile.
36662.	W. A. McCarthy, McGill, Saxon.	36739.	Sam Halley, Lee, Overland.
36663.	Chas. Addis, Roop, Ford.	36740.	E. J. Kearns, North Fork, Oldsmobile.
36664.	G. A. Ackley, Wadsworth, Ford.	36741.	Earl Green, Elko, Oldsmobile.
36665.	Roy Peterson, Reno, Ford.	36742.	John Henderson, Elko, Willys-Knight.
36666.	Red Arrow Garage, Carson City, Stude.	36743.	D. W. Lear, Lamoille, Ford.
36667.	A. P. Ceander, Reno, Ford.	36744.	G. M. Rose, Tonopah, Ford.
36668.	Silva Questa, Reno, Essex.	36745.	David Dotta, Elko, Studebaker.
36669.	Mrs. C. Charboneau, Sparks, Reo 6.	36746.	David Dotta, Elko, Ford.
36670.	O. J. Lentz, Sparks, Studebaker.	36747.	E. E. Grylla, Tonopah, Ford.
36671.	D. D. Cook, Elko, Overland.	36748.	Molini Bros., Dyer, Studebaker.
36672.	Jene Alborchar, Jiggs, Chandler.	36749.	J. E. Myers, Lamoille, Ford.
36673.	D. V. E. Wells, Battle Mountain, Ford.	36750.	R. MacDonald, Tonopah, Maxwell.
36674.	Roy Quinn, Elko, Chevrolet.	36751.	Gilbert Nostrosa, Eureka, Ford.
36675.	W. G. Greathouse, Elko, Studebaker.	36752.	Edw. F. Knemeyer, Mason, Overland.
36676.	Wm. Young, Tuscarora, Hudson.	36753.	J. W. Planck, Valmy, Ford.
36677.	Ed. E. Oldhouse, Elko, Ford.	36754.	M. C. Stewart, Alamo, Ford.
36678.	R. H. Schaeffer, Las Vegas, Hupmobile.	36755.	M. C. Stewart, Alamo, Ford.
36679.	Fred G. Monde, Deeth, Ford.	36756.	F. A. Fulkerson, Beowawe, Ford.
36680.	S. A. Wingfield, Fallon, Ford.	36757.	O. B. Hitchcock, Truckee, Cal., Dodge.
36681.	Louis Marymont, Ely, Ford.	36758.	A. D. McMillan, Yerington, Ford.
36682.	Mrs. S. A. Johnstone, Reno, Ford.	36759.	R. Raymond, Reno, Ford.
36683.	C. J. DellaMadalena, Fernley, Buick.	36760.	M. S. Booth, Fallon, Ford.
36684.	Frank B. Smith, Austin, Chevrolet.	36761.	John McKenney, Lamoille, Dodge.
36685.	W. W. Ellis, Austin, Ford.	36762.	Doroteo Hgorreta, Lee, Hudson.
36686.	Fred Etchegaray, Austin, Ford.	36763.	W. H. Supp, Wells, Ford.
36687.	Nellie Anderson, Gardnerville, Grant.	36764.	Isaac Woodhouse, Arthur, Studebaker.
36688.	W. A. Poreh, Yerington, Chevrolet.	36765.	Edwin Wade, Fallon, Overland.
36689.	A. J. Wright & Co., Tonopah, Ford.	36766.	J. D. Rowland, Aurum, Chevrolet.
36690.	Harkins & Stevens, Tonopah, Ford.	36767.	Geo. N. Carrio, Shafter, Ford.
36691.	R. H. McLaughlin, Goldfield, Oldsmobile	36768.	Benj. F. Blaylock, Elko, Ford.
36692.	R. H. Oakley, Wabuska, Ford.	36769.	John T. Rees, M. D., McDermitt, Ford.
36693.	F. W. Simpson, Simpson, Ford.	36770.	J. M. Krippner, Hawthorne, Dodge.
36694.	Samuel H. Wells, Moapa, Dodge.	36771.	J. T. Brady, Carson City, Ford.
36695.	Chas. H. Burke, Reno, Buick.	36772.	Horton Hammond, Metropolis, Ford.
36696.	J. N. Scarlett, Lovelock, Ford.	36773.	H. Heumador, Reno, Ford.
36697.	C. M. Clayton, Tecoma, Briscoe.	36774.	W. R. Robbins, Las Vegas, Ford.
36698.	Roy Haslett, Red House, Buick.	36775.	Wm. Mathews, Searchlight, Buick.
36699.	A. E. Grinnell, Fallon, Chevrolet.	36776.	J. M. Murray, Carlin, Dodge.
36700.	Henry Quill, Carson City, Buick.	36777.	Joe Saval, Battle Mountain, Ford.
36701.	John Labat, Fallon, Maxwell.	36778.	T. E. Eager, Elko, Chevrolet.
36702.	A. H. Doherty, Carlin, Ford.	36779.	R. C. Gilbert, Elko, Studebaker.
36703.	W. R. Whitehead, Lund, Ford.	36780.	Russell L. & C. Co., Elko, Ford.
36704.	Joe Cota, Golconda, Ford.	36781.	Mike Rodgers, Tonopah, Ford.
36705.	Roy Manor, Winnemucca, Maxwell.	36782.	Columbus Grove, Denio, Ore., Ford.
36706.	J. A. Callahan, Winnemucca, Mitchell.	36783.	Mrs. W. Stephenson, Winnemucca, Mitch.
36707.	John B. White, McGill, Ford.	36784.	E. N. Stidd, Winnemucca, Duplex.
36708.	C. Kirkeby, Cherry Creek, Ford.	36785.	Wm. Hebard, Winnemucca, Chalmers.
36709.	Juan Jaca, McDermitt, Buick.	36786.	T. J. Shannon, Golconda, Grant.
36710.	C. J. Reynolds, Winnemucca, Chevrolet.	36787.	Red Martin, Amos, Reo.
36711.	Walter Wade, Amos, Chevrolet.	36788.	Frank Kelsey, Winnemucca, Buick.
36712.	A. L. De Long, Amos, Ford.	36789.	Frank Kelsey, Winnemucca, Internatl.
36713.	G. A. Becker, Winnemucca, Ford.	36790.	Ellison Ranching Co., Midas, Buick.
36714.	Fred Grutt, Reno, Oakland.	36791.	Oscar Reinhart, Winnemucca, Mitchell.
36715.	V. Pelosi, Virginia City, Dodge.	36792.	A. McBride, Elko, Chevrolet.
36716.	A. Schiappacassi, Reno, Oakland.	36793.	A. McBride, Elko, Kissel.
36717.	A. W. Mayett, Manhattan, Ford.	36794.	Pierce Vose, Elko, Ford.
36718.	A. E. Erling, Verdi, Buick.	36795.	Archie Dewer, Elko, Overland.
36719.	Waddy Hunt, Beowawe, Ford.	36796.	Dr. W. L. Kisler, Sparks, Chevrolet.
36720.	J. W. Stiner, Cederville, Ford.	36797.	E. U. McDermott, Lamoille, Ford.
36721.	W. J. Hunting, Carson City, Overland.	36798.	T. L. Henry, Lamoille, Hupmobile.
36722.	J. M. Dority, Carson City, Ford.	36799.	J. W. Porter, Elko, Ford.
36723.	Land Office, Salt Lake, Utah, Ford.	36800.	Henry C. Krueger, Elko, Ford.
36724.	Land Office, Salt Lake, Utah, Naah.	36801.	Lee Harbin, Elko, Vic.
36725.	U. F. T. & T. Co., Gardnerville, Ford.	36802.	J. F. Holland, Lee, Ford.
36726.	Dr. E. T. Krebs, Carson City, Maxwell.	36803.	Pete Goicochea, Elko, Oldsmobile.
36727.	Frank Goodale, Deeth, Ford.	36804.	Kirk Cornwall, Tuscarora, Reo.
36728.	S. T. Evans, Deeth, Ford.	36805.	City of Elko, Elko, Ford.
36729.	Toney Martinez, Elko, Studebaker.	36806.	Jack J. Jackowatz, Goldfield, Dodge.
36730.	A. A. Winn, Ely, Ford.	36807.	Delos W. Hyde, Metropolis, Ford.
36731.	John M. Houbhan, Goldfield, Ford.	36808.	John L. Armistead, Lee, Ford.
36732.	W. F. Remington, McGill, Dodge.	36809.	W. F. Roseberry, Tuscarora, Chevrolet.
36733.	J. R. Puryear, Ruth, Studebaker.	36810.	W. F. Roseberry, Tuscarora, Federal.
36734.	Stanley Weathers, Deeth, Dodge.	36811.	C. D. Vantrin, Ely, Case.
36735.	Ben Richardson, Tonopah, Maxwell.	36812.	Martin Bidart, Lee, Dodge.
36736.	C. E. Durfee, Elko, Oakland.	36813.	Chas. Clayton, Elko, Dodge.
36737.	Wood Bros., Wells, Oldsmobile.	36814.	Hansford Bolton, Lee, Ford.

- 36815...Ward Martin, Lovelock, Ford.
36816...Wm. Wilson, Lovelock, Chevrolet.
36817...Mrs. D. D. Lefsey, Reno, Oakland.
36818...Hallie Ray, Reno, Buick.
36819...G. E. Fuller, Montello, Overland.
36820...C. L. Aquist, Caliente, Oakland.
36821...G. W. Davis, Sparks, Studebaker.
36822...Wm. Johnson, Wells, Hudson.
36823...Towle & Smith, Fallon, Chevrolet.
36824...U. E. Cooper, Reno, Studebaker.
36825...A. W. Reveal, Reno, Maxwell.
36826...Dan Kenefic, Reno, Overland.
36827...E. K. Springer, Reno, Chevrolet.
36828...S. C. Weeks, Jr., Wells, Cole 8.
36829...Mrs. F. B. McComb, Montello, Ford.
36830...Al. Kelliher, Tonopah, Ford.
36831...Gerald Armstrong, Fallon, Michigan.
36832...Anna Johnson, Fallon, Ford.
36833...A. D. Botton, Fallon, Ford.
36834...W. E. Turley, Reno, Cadillac.
36835...Elizabeth Sweetland, Reno, Ford.
36836...F. B. McDaniel, Sparks, Ford.
36837...Daisy Kenadall Oddie, Reno, Cadillac.
36838...Thomas Young, Tonopah, Ford.
36839...Giles C. Hard, Reno, Ford.
36840...Holmes & Sutton, Tonopah, Cadillac.
36841...Chas. Thraillik, Yerington, Buick.
36842...Gaston Bros., Wellington, Dodge.
36843...Baker & Sweet, Yerington, Ford.
36844...Chad. C. Winter, Elko, Dodge.
36845...W. R. Toombs, Elko, Ford.
36846...Archie Clayton, Elko, Pan Motor Co.
36847...Archie Clayton, Elko, Republic.
36848...J. M. Prunty, Charleston, Dodge.
36849...W. C. Owens, Carlin, Stoddard-Dayton.
36850...Thos. Dorsey, Tonopah, Chandler.
36851...Orin C. Troup, Carlin, Buick.
36852...R. J. Donnelly, Tonopah, Maxwell.
36853...Carson Creamery Co., Carson, Republic.
36854...Mrs. F. E. Spangenberg, Carson, Ford.
36855...G. M. Reading, Hawthorne, White.
36856...G. M. Reading, Hawthorne, White.
36857...Chris. Dahlstrom, Goldfield, Ford.
36858...W. D. Owens, Carlin, Ford.
36859...A. J. McDermott, Deeth, Ford.
36860...Ulten P. McDermott, Deeth, Ford.
36861...A. B. Meyers, Lurline, Buick.
36862...Percy Rupp, Bullion, Ford.
36863...H. A. McMurtrey, Elko, Ford.
36864...G. S. Brown, Elko, Ford.
36865...John G. Frank, Tonopah, Overland.
36866...G. K. Faber, McGill, Maxwell.
36867...J. L. Raffetto, Reno, Oldsmobile.
36868...Utah Con. Co., Montello, G.M.C.
36869...James Hogan, Battle Mountain, Ford.
36870...J. W. Simkins, Joseco, Ford.
36871...David Francis, Uraine, Ford.
36872...R. C. Ricker, Wellington, Overland.
36873...Leo Springmeyer, Gardnerville, Ford.
36874...Wells Williams, Reno, Maxwell.
36875...Mrs. L. E. Shepley, Sparks, Studebaker.
36876...J. E. Hicks, Fallon, Chevrolet.
36877...Serafin Esteves, Tonopah, Ford.
36878...G. B. Welsh, Sharp, Ford.
36879...John J. Hunter, Elko, Ford.
36880...W. A. Stinson, Elko, Overland.
36881...J. A. Sewell, Owyhee, Ford.
36882...J. A. Sewell, Owyhee, Desmond.
36883...J. A. Sewell, Owyhee, Case.
36884...Ben Pearson, Montello, Ford.
36885...E. Simon, Battle Mountain, Reo.
36886...C. L. Carter, Kimberly, Ford.
36887...Frank J. Fisk, McGill, Ford.
36888...M. E. Willis, Metropolis, Ford.
36889...George Yowell, Lee, Ford.
36890...Williams L. & L. S. Co., Elko, P. Arrow.
36891...Chris. Eshleman, Elko, Ford.
36892...Geo. Austin, Jungo, Ford.
36893...Billie Robinson, Winnemucca, Ford.
36894...Thos. Major, Golconda, Cadillac.
36895...C. J. Berry, Midas, Republic.
36896...R. T. Evans, Winnemucca, Reo.
36897...B. M. Bateman, Tonopah, Dodge.
36898...Miss Gladys Werner, Reno, Ford.
36899...R. Scholtz, Orena, Ford.
36900...J. O. Walther, Goldfield, National.
36901...Oleacha Bros., Aurum, Chandler.
36902...Joe Geizer, Ely, Chevrolet.
36903...Silver Divide Mfg. Co., Tonopah, Ford.
36904...Clyde Jackson, Tonopah, Ford.
36905...Charlot Divide Mfg. Co., Tonopah, Ford.
36906...L. E. Palmer, Tonopah, Ford.
36907...Lee F. Hand, Tonopah, Ford.
36908...A. J. Wright & Co., Tonopah, Ford.
36909...Wilson Divide Mfg. Co., Tonopah, Ford.
36910...James Snyder, Tonopah, Ford.
36911...Clay Coveney, Tonopah, Hupmobile.
36912...Louis V. Pfum, Imlay, Pope-Hartford.
36913...N. C. Prater Co., Virginia City, Ford.
36914...Allied Divide M. Co., Goldfield, Buick.
36915...White Pine County, Ely, Dodge.
36916...Robert Henderson, Montello, Dodge.
36917...F. J. Hanus, Tonopah, Ford.
36918...United C. & Pkg. Co., Tonopah, Ford.
36919...T. A. Musante, Tonopah, Dodge.
36920...A. T. Johnston, Tonopah, Ford.
36921...W. L. McGregor, Tonopah, Reo.
36922...Divide Annex M. Co., Tonopah, Ford.
36923...Wm. Corcoran, Tonopah, Ford.
36924...W. W. Garlinghouse, Mina, Ford.
36925...Geo. Montrose, Gardnerville, Studebaker.
36926...M. Jepsen, Gardnerville, Buick.
36927...James Logan, Tonopah, Ford.
36928...M. D. Crosby, Wadsworth, Chevrolet.
36929...Florence McMullen, Nysala, Ford.
36930...Joseph A. Vanerly, Austin, Overland.
36931...Ed. Skillman, Eureka, Ford.
36932...Fred Bartine, Eureka, Ford.
36933...S. P. McMullen, Deeth, Ford.
36934...Geo. A. Grock, Deeth, Overland.
36935...S. P. McMullen, Deeth, Haynes.
36936...J. G. Griswold, Deeth, Dodge.
36937...H. A. Day, Wells, Chevrolet.
36938...C. L. Parker, Wells, Ford.
36939...B. C. Gibson, Cherry Creek, Paige.
36940...National Divide M. Co., Reno, Ford.
36941...I. C. Johnson, Las Vegas, Ford.
36942...G. T. Tuttle, Tuscarora, Overland.
36943...Ed. Carville, Elko, Buick.
36944...Verdi Lumber Co., Elko, Buick.
36945...Emeterio Plazo, Lamolille, Hudson.
36946...Jas. L. Smith, Sparks, Maxwell.
36947...C. W. Muller, Winnemucca, Buick.
36948...A. W. Smith, Lurline, Studebaker.
36949...State Engineer, Carson City, Chevrolet.
36950...Roy Nesmitt, Carson City, Ford.
36951...Dan Young, Tuscarora, Ford.
36952...Wilbur Gardner, Ruby Valley, Ford.
36953...C. B. Wilson, Ruby Valley, Ford.
36954...Wm. Gardner, Ruby Valley, Hudson.
36955...Eva Hebbard, Reno, Hupmobile.
36956...Bissinger & Co., Elko, Ford.
36957...S. B. Bieroth, Rowland, Studebaker.
36958...L. Little, Elko, Peerless.
36959...L. Little, Elko, Peerless.
36960...J. N. Phillips, Tuscarora, Dodge.
36961...J. N. Phillips, Tuscarora, Kissel Kar.
36962...Arthur Drown, Lee, Buick.
36963...Clyde Long, Jiggs, Chevrolet.
36964...W. L. Warren, Sparks, Cadillac.
36965...D. C. McDonald, Ely, Ford.
36966...Jennie M. Neminger, Ely, Chevrolet.
36967...C. W. Bagwill, McGill, Jeffrey.
36968...Alex Noble, Parker, Ford.
36969...Oleascha Bros., Aurum, Hupmobile.
36970...Wm. H. Harwood, Hamilton, Dodge.
36971...Mrs. Meta Dunfield, Las Vegas, Buick.
36972...Pete Cassinelli, Reno, Chandler.
36973...Mrs. Grace Duval, Elko, Overland.
36974...Fred Reim, Goodsprings, Ford.
36975...M. George Wade, Goodsprings, Reval.
36976...M. George Wade, Goodsprings, Ford.
36977...Isaac Griswold, Deeth, Overland.
36978...H. A. Stewart, Tonopah, Maxwell.
36979...Arthur T. Ruffles, Tonopah, Ford.
36980...Roy Taylor, Tonopah, Ford.
36981...Dick Bennett, Round Mountain, Ford.
36982...J. W. Weaver, Tonopah, Parry.
36983...O. L. Davis, Mina, Ford.
36984...Ernest Rackliff, Mina, Reo.
36985...Ernest Rackliff, Mina, Ford.
36986...W. L. Taylor, Manhattan, Dodge.
36987...Frank McDevit, Yerington, Ford.
36988...W. B. Evans, Tonopah, Dodge.
36989...J. Klinger, Tonopah, Buick.
36990...Silverfields Ajax M. Co., Tonopah, Ford.

36991. R. B. Forman, Tonopah, Hupmobile.
 36992. J. E. Farnham, Tonopah, Ford.
 36993. J. C. Sumner, Tonopah, Ford.
 36994. F. O. O'Connell, Tonopah, Ford.
 36995. Leon F. Dony, Verdi, Chandler.
 36996. H. F. Bruce, Tonopah, Oldsmobile.
 36997. A. F. Dunn, Goldfield, Buick.
 36998. George Kennedy, Reno, Ford.
 36999. K. J. Crawford, McGill, Chevrolet.
 37000. C. S. Brown, Carlin, Overland.
 37001. Lovelock Mier. Co., Lovelock, Studebaker.
 37002. J. E. Snelson, Elko, Mercer.
 37003. Nevada Stock Farm, Reno, Chevrolet.
 37004. Peter Rembo, Ely, Maxwell.
 37005. E. A. Harrington, Kimberley, Ford.
 37006. N. I. McCloy, Beowawe, Ford.
 37007. Gus Jonsson, Tonopah, Maxwell.
 37008. Jos. F. Farreu, Tonopah, Ford.
 37009. L. L. Wedertz, Simpson, Geo.
 37010. Geo. Chamberlain, Reno, E.M.F.
 37011. Ed. Morse, Eureka, Ford.
 37012. Chas. Leon Davis, Tonopah, King.
 37013. Maline Robinson, Las Vegas, Gordon.
 37014. E. D. Warr, Tonkin, Ford.
 37015. F. M. Manson, Reno, Cadillac.
 37016. W. H. Benson, Amos, Ford.
 37017. D. W. Cathcart, Paradise, Ford.
 37018. W. J. Bell, Winnemucca, Ford.
 37019. Martin Legarza, Amos, Buick.
 37020. W. J. Bell, Winnemucca, Studebaker.
 37021. Kimberley Mines Co., Kimberley, Hercules.
 37022. Nevada Life Ins. Co., Reno, Oldsmobile.
 37023. C. T. Smith, Gerlach, Ford.
 37024. Robert J. Wilson, Tonopah, Hudson.
 37025. J. F. Greaves, Mina, Ford.
 37026. Wonder Divide M. Co., Goldfield, Ford.
 37027. John J. Thompson, Tonopah, Olds.
 37028. Arrah Newton, Tonopah, Willys-Dix.
 37029. F. J. DeLongchamps, Reno, Chevrolet.
 37030. Hans Olson, Caliente, Chevrolet.
 37031. Wayne Etter, Clover City, Chevrolet.
 37032. R. L. McNett, Dyer, Studebaker.
 37033. A. E. Lowe, Tonopah, Essex.
 37034. O. F. Badwin, Reno, Dodge.
 37035. W. H. Aby, Goldfield, Dodge.
 37036. W. H. Montgomery, Goldfield, Buick.
 37037. D. E. Tux, Tonopah, Overland.
 37038. F. H. Meyer, Yerington, Ford.
 37039. Western Ore Purch. Co., Reno, Ford.
 37040. Wm. C. Newton, Reno, Overland.
 37041. M. Husery, Tuscarora, Ford.
 37042. E. K. McCoy, Elko, Ford.
 37043. J. M. Caprioia, Lamolite, Ford.
 37044. G. C. Riser, McGill, Studebaker.
 37045. Edward J. Gilvert, Elko, Ford.
 37046. Oscar Peterson, Lee, Ford.
 37047. J. J. Hanifan, Fallon, Ford.
 37048. H. M. Crow, Wells, Chevrolet.
 37049. Dan L. Dillon, Tonopah, Case.
 37050. Sunbeam Divide M. Co., Tonopah, Buick.
 37051. Divide Const. Co., Tonopah, Ford.
 37052. Jim Savage, Virginia, Buick.
 37053. A. A. Schole, Gardnerville, Overland.
 37054. Chas. Clayton, Elko, Dodge.
 37055. W. S. Short, Lurline, Dodge.
 37056. Harry Trott, Lamolite, Oldsmobile.
 37057. T. B. Park, Elko, Dodge.
 37058. Austin Dakota Dev. Co., Austin, Ford.
 37059. Mrs. John Hickison, Austin, Oldsmobile.
 37060. F. L. Middleton, Elko, Willys-Knight.
 37061. Orma Boyer, Elko, Overland.
 37062. W. B. Griffith, Tuscarora, Ford.
 37063. Miss Ruth Leon, Reno, Hudson.
 37064. J. C. Jones, Fallon, Oakland.
 37065. Hans Bach, Reno, Cadillac.
 37066. C. J. Barnes, McGill, Dodge.
 37067. E. W. Hahell, Middas, Overland.
 37068. Frank Pruno, Paradise, Studebaker.
 37069. R. S. Bolam, Winnemucca, Crow-Elkhart.
 37070. Josephine Lanceria, Amos, Dodge.
 37071. S. W. Collins, Rebel Creek, Ford.
 37072. Elison Ranching Co., Rebel Creek, Ford.
 37073. L. W. Minor, McDermitt, Ford.
 37074. Ed. N. Jump, Platora, Ford.
 37075. L. O. Landy, Winnemucca, Ford.
 37076. Manuel Betencourt, Yerington, Overland.
 37077. L. S. Evans, Tonopah, Ford.
 37078. Rosetta Divide M. Co., Tonopah, Chev.
 37079. Rosetta Divide M. Co., Tonopah, Rep.
 37080. Stall Bros., Reno, Buick.
 37081. James G. Mater, Tonopah, Ford.
 37082. G. A. Roberts, Tonopah, Ford.
 37083. Toggery Divide M. Co., Tonopah, Ford.
 37084. R. M. Bradley, Tonopah, Ford.
 37085. Giant Divide M. Co., Tonopah, Ford.
 37086. F. M. Foster, Tonopah, Ford.
 37087. Mrs. T. H. Drom, Manhattan, Buick.
 37088. C. F. Weber & Co., Reno, Buick.
 37089. J. P. Eyheralt, McGill, Ford.
 37090. Adams & McGill Co., Ely, Ford.
 37091. Ely Meat Co., Ely, Ford.
 37092. Pete Smilneck, Ruth, Ford.
 37093. Wm. H. Currie, Ruth, Ford.
 37094. A. B. Bonham, East Ely, Dodge.
 37095. Jerry Kent, Ely, Chevrolet.
 37096. Alexander McQueen, Ely, Hupmobile.
 37097. B. F. Ross, Ely, Ford.
 37098. George Smith, Lurline, Studebaker.
 37099. Vecinti Juristi, Lee, Studebaker.
 37100. J. W. Legate, Carson City, Ford.
 37101. Henry Krinka, Arthur, Studebaker.
 37102. R. C. Thompson, Reno, Dodge.
 37103. Sylvia B. Weeks, Wells, Overland.
 37104. F. A. Nolan, Eagleville, Chevrolet.
 37105. R. J. McEuen, Fallon, Buick.
 37106. Martin Kline, Sparks, Studebaker.
 37107. E. R. Trotter, Reno, Ford.
 37108. H. B. Robison, Baker, Ford.
 37109. W. G. Meecham, Baker, Ford.
 37110. Francis Brim, McGill, Case.
 37111. J. M. Fenwich, Tonopah, Oakland.
 37112. H. M. Stary, Tonopah, Ford.
 37113. M. W. Jellinek, Goldfield, Ford.
 37114. Manionchi Bros., Yerington, Ford.
 37115. Pete Felesina, Carson City, Maxwell.
 37116. Chas. McLeod, Yerington, Buick.
 37117. W. A. Browne, Reno, Ford.
 37118. H. Sutton, Elko, Ford.
 37119. Wm. Curnow, Sparks, Schacht.
 37120. D. R. Thomson, Carlin, Ford.
 37121. Geo. Ostergard, McGill, Ford.
 37122. Chas. B. Pike, Elko, Mack.
 37123. Dan Callahan, Fallon, Studebaker.
 37124. G. G. Buzzetti, Steptoe, Overland.
 37125. Thomas Harney, Pioche, Ford.
 37126. W. F. Stanley, Denio, Ore., Ford.
 37127. K. R. McKenzie, Denio, Ore., Ford.
 37128. Geo. Friedhoff, Yerington, Ford.
 37129. Geo. Friedhoff, Yerington, Ford.
 37130. Astec Divide M. Co., Tonopah, Oakland.
 37131. John G. Taylor, Lovelock, Marmon.
 37132. John G. Taylor, Lovelock, Federal.
 37133. A. H. Bordewich, Carson City, Cartecar.
 37134. J. W. Locklin, Virginia City, Dort.
 37135. Keystone Divide M. Co., Tonopah, Ford.
 37136. Mrs. Della Meaglia, Tonopah, Hudson.
 37137. Harry A. Tieslau, Tonopah, Ford.
 37138. Jims Divide M. Co., Tonopah, Ford.
 37139. Florence Divide M. Co., Tonopah, Ford.
 37140. Walter F. Post, Gold Hill, Dodge.
 37141. Mrs. Glen Saxton, Thompson, Dodge.
 37142. O. T. Brucefield, Goldfield, Ford.
 37143. Stacy Taylor, Goldfield, Ford.
 37144. Edgar Young, Tuscarora, Ford.
 37145. A. Kaiser, Reno, Chevrolet.
 37146. Mrs. Otto Hook, Reno, Chevrolet.
 37147. Sherman Thomas, Overton, Ford.
 37148. George Martin, Tecoma, Hupmobile.
 37149. A. J. Lord, Montello, Reo 6.
 37150. A. J. Lord, Montello, Duplex.
 37151. A. J. Lord, Montello, Indian.
 37152. A. J. Lord, Montello, Indian.
 37153. Felix Turillas, Reno, Cadillac.
 37154. Mrs. Ellen Griffith, Carlin, Overland.
 37155. F. E. Cudney, Elko, Paige.
 37156. R. G. Heritage, Fallon, Buick.
 37157. Jack Shepard, Elko, Buick.
 37158. G. M. Southward, Elko, Buick.
 37159. Joe Albright, Lee, Ford.
 37160. J. A. Gilbert, Palisade, Cadillac.
 37161. H. D. Sprague, Carson City, Dodge.
 37162. M. D. O'Brien, Reno, Hupmobile.
 37163. Sam Leon, Gardnerville, Overland.
 37164. F. A. Williams, Reno, Chevrolet.
 37165. A. R. Gully, Wells, Overland.
 37166. Jas. H. Allen, Metropolis, Ford.

- 37167...C. S. Davis, Deeth, Ford.
 37168...Mike Loutre, Elko, Studebaker.
 37169...Howard Morse, North Fork, Studebaker.
 37170...C. H. Keith, Elko, Essex.
 37171...M. F. Jukes, Elko, Essex.
 37172...Geo. Williams, Elko, Essex.
 37173...Wm. A. Marsh, Tonopah, Oakland Six.
 37174...P. J. Carter, Manhattan, Ford.
 37175...L. R. Knorr, Paradise, Chevrolet.
 37176...M. D. Browder, Fallon, Ford.
 37177...E. J. Ramsey, Tonopah, Nelson.
 37178...Ed. F. Heckethorne, Tonopah, Hupmo.
 37179...H. J. Pick, Hawthorne, Ford.
 37180...Thos. Wilson, Reno, Chevrolet.
 37181...Emanuel Moriconi, Simpson, Ford.
 37182...Q. D. Boyd, Halleck, Ford.
 37183...Mrs. Oscar Miller, Tuscarora, Ford.
 37184...Chas. Tamaha, McGill, Ford.
 37185...George S. Hurst, Ruth, Essex.
 37186...L. P. Cooper, Ely, Ford.
 37187...Chas. R. Clarkson, Las Vegas, Ford.
 37188...Hazel Gray, Wells, Ford.
 37189...J. W. Kromer, Lovelock, Chevrolet.
 37190...A. J. Richards, Alamo, Ford.
 37191...Nevada Butler, Tuscarora, Ford.
 37192...Mrs. Alfred R. Peckham, Reno, Ford.
 37193...R. B. Todd, Reno, Ford.
 37194...Mrs. Phoenix Corcoran, Reno, Ford.
 37195...M. T. Doyle, Reno, Ford.
 37196...P. Bidgeman, Reno, Ford.
 37197...Wm. R. Cochran, Tonopah, Oakland.
 37198...C. M. Peek, Reno, Chevrolet.
 37199...Fred Wheatley, Elko, Maxwell.
 37200...Mrs. J. Biles, Elko, Ford.
 37201...Metropolis Land Co., Metropolis, Ford.
 37202...J. R. Kleckner, Lee, Ford.
 37203...Chas. Anderson, Reno, Ford.
 37204...Ed. Wilkerson, Tuscarora, Ford.
 37205...James E. Cox, Goodsprings, Ford.
 37206...Sunny Divide Mines Co., Reno, Dodge.
 37207...Mrs. Frank L. Waltz, Verdi, Ford.
 37208...R. G. McDonald, Mina, Dort.
 37209...E. Succetti, Luning, Saxon.
 37210...Mrs. Ella Kind, Tonopah, Chandler.
 37211...J. F. Riordan, Mountain City, Dodge.
 37212...Frank Winchell, Wells, Dodge.
 37213...G. B. Barmess, Arthur, Ford.
 37214...G. J. Blacett, Gerlach, Chevrolet.
 37215...Dr. Victor W. Poulsen, Reno, Dodge.
 37216...F. S. Lamberson, Yerington, Studebaker.
 37217...Jeff J. Poole, Sparks, Oakland.
 37218...John Ward, Las Vegas, Ford.
 37219...Wesley Sexsmith, Virginia City, Reo.
 37220...Mrs. Chas. B. Henderson, Elko, Cadillac.
 37221...Patrick Ahern, Tonopah, Studebaker.
 37222...Harry Kramer, Tonopah, Ford.
 37223...J. Good, Goldfield, Buick.
 37224...Mrs. W. J. Luke, Reno, Overland.
 37225...W. G. Hellier, Tonopah, Buick.
 37226...James L. Campbell, Reno, Ford.
 37227...Roy Pratt, North Fork, Ford.
 37228...R. F. Roseberry, Tuscarora, Ford.
 37229...H. A. Talley, Elko, Studebaker.
 37230...S. M. Wolf, Metropolis, Ford.
 37231...J. F. Christopherson, Baker, Jeffrey.
 37232...Dr. A. F. Adams, Ely, Overland.
 37233...F. B. Matson, Ely, Ford.
 37234...Al. Marsh, Ely, Chevrolet.
 37235...Irwin Colburn, Ruth, Ford.
 37236...Joe O. Long, Ruth, Briscoe.
 37237...W. H. Acocks, Ruth, Buick.
 37238...Thomas King, McGill, Ford.
 37239...Thos. Hawthorne, Fallon, Chevrolet.
 37240...F. J. Stevens, Carlin, Maxwell.
 37241...Mebius & Dresher, Reno, Buick.
 37242...Joe Cathcart, Paradise, Ford.
 37243...George Cahill, East Ely, Buick.
 37244...Ed. Faith, E. A. McGinn, McGill, Ford.
 37245...Wm. Rutledge, Carlin, Ford.
 37246...John Hill, Montello, Ford.
 37247...W. H. Corbiere, Imlay, Overland.
 37248...Fred H. Horn, Tuscarora, Overland.
 37249...Brose Truett, Metropolis, Maxwell.
 37250...Walter Long, Wells, Reo.
 37251...F. E. Gorham, Winnemucca, Ford.
 37252...Mrs. H. Edmunds, Winnemucca, Ford.
 37253...Joe Schell, Imlay, Dodge.
 37254...M. Schroeder, Winnemucca, Reo.
 37255...J. A. Rogers, Winnemucca, Chevrolet.
 37256...Frank Pultz, Winnemucca, Buick.
 37257...M. R. Felts, Gerlach, Federal.
 37258...M. R. Felts, Gerlach, Overland.
 37259...M. R. Felts, Gerlach, Federal.
 37260...E. S. Bates, Reno, Overland.
 37261...C. H. G. Eisenmenger, Reno, Buick.
 37262...Della Pollock, Sparks, Oakland 6.
 37263...C. R. Morris, Virginia City, Buick.
 37264...J. L. Patnande, Round Mountain, Chai.
 37265...Jas. G. Wood, Virginia City, Hudson.
 37266...J. D. Grant, Tonopah, Lexington.
 37267...A. Y. Werner, Gardnerville, Buick.
 37268...A. B. Dickinson, Wellington, Dodge.
 37269...Mark R. Averill, Tonopah, Dodge.
 37270...L. H. Bartholemew, Reno, Chevrolet.
 37271...C. M. Henningsen, Glenbrook, Buick.
 37272...E. G. Bennett, Las Vegas, Jeffery.
 37273...E. G. Bennett, Las Vegas, Moon 6.
 37274...C. M. Henningsen, Glenbrook, Buick.
 37275...Gilbert C. Ross, Reno, Chalmers 6.
 37276...Alex M. Boyle, Reno, Chevrolet.
 37277...Marguerita Armstrong, Silver, Mitchell.
 37278...Victor M. Place, Tonopah, Ford.
 37279...P. L. Saunders, Goldfield, Ford.
 37280...Wm. Hickinson, Austin, Ford.
 37281...Lorin Hall, Ely, Ford.
 37282...Fashion Cleaners, Sparks, Ford.
 37283...Manuel Erro, Lamolle, Dodge.
 37284...E. P. Bihlmaier, Elko, Overland.
 37285...E. A. Scheckler, Fallon, Ford.
 37286...George D. Charchalla, Ely, Hudson.
 37287...Rain Bow M. Co., Denis Ore., P. Arrow.
 37288...Lee McNew, Lamolle, Ford.
 37289...Ralph Casey, Reno, E.M.F.
 37290...F. H. Luetjens, Reno, Overland.
 37291...Dan W. Gillen, Omco, Parlin Palmer.
 37292...O. W. Coughlin, Reno, Chalmers.
 37293...Pete Demosthenes, Reno, Ford.
 37294...J. F. Vulgamore, Sparks, Ford.
 37295...Joseph Rawsen, Jr., Reno, Ford.
 37296...O. T. Johnson, Reno, Ford.
 37297...J. A. Ruland, Reno, Ford.
 37298...Al James, Las Vegas, King.
 37299...Dr. J. West Smith, Caliente, Chevrolet.
 37300...Fred Calton, Metropolis, Ford.
 37301...C. B. Morton, Cobro, Ford.
 37302...Leslie J. Warner, Cobro, Ford.
 37303...Odgers Brothers, Currie, Dodge.
 37304...T. G. Williams, Deeth, Buick.
 37305...R. J. Krenka, Arthur, Ford.
 37306...Joe Ciolina, Eureka, Ford.
 37307...Andy Pastorina, Eureka, Ford.
 37308...Joe A. Brown, Reno, Cadillac.
 37309...F. T. West, Ely, Dodge.
 37310...James T. Calahan, Wadsworth, Ford.
 37311...Mrs. Bird G. Lindsay, Carson, Maxwell.
 37312...Union L. & C. Co., Deeth, Liberty.
 37313...Union L. & C. Co., Deeth, Ford.
 37314...Union L. & C. Co., Deeth, Chevrolet.
 37315...Union L. & C. Co., Deeth, Chevrolet.
 37316...D. W. Fullerton, Clover City, Ford.
 37317...A. Wellmunster, Vya, Dodge.
 37318...Milton E. Cameron, Reno, Studebaker.
 37319...J. H. Ramsey, Reno, Reo.
 37320...Jake Wainwright, Reno, Chevrolet.
 37321...R. E. McPartland, Fernley, Ford.
 37322...Lynn Big 6 M. Co., Carlin, Ford.
 37323...Bert Stoddard, Lee, Ford.
 37324...Morris Guldager, Arthur, Ford.
 37325...Alonso L. Bohne, Arthur, Dodge.
 37326...Wm. Little, Kimberly, Ford.
 37327...Rade Match, McGill, Vim.
 37328...C. E. Harbold, Ely, Ford.
 37329...John A. Magnuson, McGill, Studebaker.
 37330...Steve Doutre, Aurum, Republic.
 37331...R. A. Yelland, Taft, Dodge.
 37332...J. M. Connell, Ruth, Ford.
 37333...W. J. Stewart, Ely, Ford.
 37334...Ted Oxborrow, Lund, Ford.
 37335...George Beckley, Tonopah, Reo.
 37336...J. E. Bevis, Tonopah, Buick.
 37337...Merritt-Olds Trucking Co., Minden, Intl.
 37338...J. H. Heward, Gerlach, Ford.
 37339...Com. Ph. M. Co., Virginia, Pierce Arrow.
 37340...Maybelle Saunders, Carson City, Over.
 37341...H. H. Raycraft, Carson City, Ford.
 37342...J. H. Cazier & Sons Co., Wells, Dodge.
 37343...Henry Martin, Ruth, Buick.
 37344...W. H. Gilmer & Sons, O'Neil, Buick.

37345. J. W. Crane, Goldfield, Ford.
37346. S. D. Cordingley, Cobre, Ford.
37347. T. S. Hook, Gardnerville, Hupmobile.
37348. Ralph M. Case, Winnemucca, Ford.
37349. Cobwell Co., Tonopah, Hudson.
37350. J. H. Gordon, Las Vegas, Ford.
37351. John Witt, Goldfield, Buick.
37352. A. S. Plummer, Reno, Lexington.
37353. C. J. Littlefield, Elko, Dodge.
37354. Hoyt Merc. Co., Lamolille, Dodge.
37355. C. H. Reinken, Lamolille, Dodge.
37356. Spence Teeler, Fallon, Overland.
37357. Elko Music Co., Elko, Chevrolet.
37358. N. E. McAbee, Wells, Case.
37359. Sam Norton, Fallon, Ford.
37360. Roy Stoddard, Reno, Oldsmobile.
37361. Truckee Meadows S. Co., Reno, Olds.
37362. Mrs. O. J. Heath, Austin, Dodge.
37363. Robert T. Bass, Golconda, Ford.
37364. F. C. Krenkel, Winnemucca, Buick.
37365. L. F. Liotta, Winnemucca, Studebaker.
37366. Thos. F. Minor, Plator, Reo.
37367. E. L. Critchfield, Las Vegas, Overland.
37368. T. R. Landsborough, Tonopah, Buick.
37369. A. S. Phipps, Yerington, Sayers & Scov.
37370. H. A. James, Virginia City, Buick.
37371. Thos. B. Stinton, Mountain City, Nash.
37372. W. D. Reeder, Sunkist, Overland.
37373. Bert Jarvis, Owyhee, Kissel Kar.
37374. Highway Dept., Carson City, Ford.
37375. Highway Dept., Carson City, Ford.
37376. Highway Dept., Carson City, Chevrolet.
37377. Highway Dept., Carson City, Ford.
37378. E. H. Simonsen, Simonsen, Overland.
37379. Walter Bowler, Tonopah, Buick 6.
37380. Florence Harrison, Reno, Buick.
37381. M. K. Tooney, Reno, Ford.
37382. John D. McFarlane, Elko, Studebaker.
37383. Chas. T. Heinz, Reno, Ford.
37384. E. Foutch, Virginia City, Overland.
37385. H. C. Mulcahy, Sparks, Buick.
37386. Ralph C. Olsen, Sulphur, Ford.
37387. H. J. Jones, Elko, Overland.
37388. A. A. Jackson, Elko, Buick.
37389. W. S. McKinsey, Carlin, Ford.
37390. T. H. Blair, McGill, Saxon 6.
37391. S. J. Weeks, Wells, Buick 6.
37392. W. C. Bradshaw, Paradise, Maxwell.
37393. S. C. Stratton, Beowawe, Ford.
37394. F. C. Wilkinson, McDermitt, Ford.
37395. Frank Silve, Winnemucca, Overland.
37396. D. H. McNich, Winnemucca, Buick.
37397. F. L. McAbee, Winnemucca, Chevrolet.
37398. Joe Geulani, Dayton, Buick.
37399. Tom Fradsham, Carson City, Ford.
37400. Fred Wood, Las Vegas, Packard.
37401. N. L. Leonard, Caliente, Ford.
37402. Dan D. Amaden, Pioche, Overland.
37403. Irwin Bros., Currant, Ford.
37404. Jas. R. Hudson, McGill, Chevrolet.
37405. Sylvester Smiley, Deeth, Buick.
37406. Wellington Wieland, Elko, Ford.
37407. Steve Damele, Tonkin, Ford.
37408. Antone Damele, Tonkin, Ford.
37409. M. Gregg, Tonkin, Ford.
37410. James Mackey, Eureka, Ford.
37411. William Easton, Austin, Ford.
37412. L. C. Musgrove, Arthur, Ford.
37413. E. J. Bridges, Packard, Dodge.
37414. Walter Ashton, Fallon, Ford.
37415. Thos. P. Wynkoop, Reno, Buick.
37416. John Desmond, Tonopah, Chevrolet.
37417. Mrs. M. C. Howe, Reno, Chevrolet.
37418. Peter Dohr, Reno, Chevrolet.
37419. May Malcolm, Reno, Premier.
37420. J. S. Popovich, Elko, Ford.
37421. John Regahl, Wonder, Ford.
37422. P. P. Batchelder, Elko, Ford.
37423. J. B. Leavitt, Flanigan, Studebaker.
37424. Lee Hyton, Jiggs, Oldsmobile.
37425. Ernest E. Murphy, Eagleville, Ford.
37426. Harry B. Marsh, Fallon, Metz.
37427. D. Filippelli, Reno, Oakland.
37428. A. C. Tidwell, Reno, Reo.
37429. A. L. Shaw, Reno, Chevrolet.
37430. Oscar Phil, Tonopah, Oakland 6.
37431. Mrs. O. Coombe, Tonopah, Ford.
37432. J. W. Strader, Tonopah, Ford.
37433. Progress Bakery, Tonopah, Ford.
37434. Lookout Divide M. Co., Tonopah, Ford.
37435. Kernick Divide M. Co., Tonopah, Ford.
37436. J. A. McLaughlin, Hornsilver, Loco.
37437. Wm. Schacht, Yerington, Dodge.
37438. J. F. Van Every, Queen, Dodge.
37439. W. A. Reinken, Ruby Valley, Dodge.
37440. Reno Divide M. Co., Tonopah, Reo.
37441. B. I. Bohall, Carson City, Overland.
37442. Hull City Divide M. Co., Tonopah, Loco.
37443. Don L. Cooper, Lovelock, Stutz.
37444. W. F. Boyken, Midas, Dodge.
37445. E. C. Morrison, Winnemucca, Hupmo.
37446. George S. Reed, Paradise, Ford.
37447. J. H. Arthur, Fallon, Chevrolet.
37448. Thomas Cavender, Elko, Ford.
37449. E. E. Glaser, Tobar, Dodge.
37450. B. L. Clem, Montello, Ford.
37451. Thomas S. Powell, Las Vegas, Ford.
37452. Frank W. Hammond, Fallon, Studebkr.
37453. Dedmon & Sons, Reno, Studebaker.
37454. Cadiini Bros., Derby, Dodge.
37455. E. A. Hendrix, Jr., Lund, Ford.
37456. J. H. Hendrix, Lund, Ford.
37457. E. C. Wood, Wells, Maxwell.
37458. Andrew Westfall, Lovelock, Reo 6.
37459. Arthur Park, Gardnerville, Buick.
37460. John Allard, Gardnerville, Ford.
37461. Dr. Wm. L. Howell, Gardnerville, Over.
37462. C. J. Wright, Reno, Ford.
37463. A. J. Johnston, Yerington, Ford.
37464. T. R. G. E. Co., Virginia City, Dodge.
37465. Maggie Messner, Fort Bidwell, Ford.
37466. Shober J. Rogers, Carson City, Over.
37467. Standard Oil Co., Yerington, Mack.
37468. D. Galko, Elko, Ford.
37469. D. M. Webb, Las Vegas, Ford.
37470. Frank Poles, Pioche, Chevrolet.
37471. J. A. Bieker, Carlin, Ford.
37472. Edgar Sadler, Eureka, Ford.
37473. Peter Larsen, Fallon, Chevrolet.
37474. A. Peterson, Hawthorne, Ford.
37475. Dave Anderson, Fallon, Ford.
37476. C. W. Wilson, Hazen, Ford.
37477. U. S. Bureau Public Roads, Reno, Ford.
37478. Mrs. L. Bovard, Yerington, Hupmobile.
37479. Henry Emmons, Glenbrook, Ford.
37480. Kienzing Produce Co., Tonopah, Ford.
37481. M. Avonson, Reno, Hupmobile.
37482. C. DuBois, Reno, Mitchell.
37483. Chas. R. Smith, Tonopah, Maxwell.
37484. G. Colosa, Virginia City, Studebaker.
37485. G. Quilici & Co., Reno, Hupmobile.
37486. Y. Bekin, Ely, Chandler.
37487. Emmet Walsh, Goldfield, Dodge.
37488. L. H. Harris, Tobar, Ford.
37489. L. Gardella, Verdi, Overland.
37490. Irene M. Wischman, Reno, Dodge.
37491. E. H. Hursch, Fallon, Cunningham.
37492. Eugene Grutt, Hawthorne, Overland.
37493. L. L. Holt, Tonopah, Ford.
37494. Joe Farrell, Mina, Ford.
37495. Alex Anderson, Tonopah, Ford.
37496. Pete Barne, Gardnerville, Hudson.
37497. Bert Dake, Minden, Ford.
37498. Ed. Malley, Carson City, Overland.
37499. L. B. Spencer, Mina, Oakland.
37500. Mrs. J. T. Boyd, Reno, Pilot 6.
37501. J. T. Boyd, Reno, Buick.
37502. Wm. Rowling, Virginia City, Chevrolet.
37503. Ed. McKelvey, Tonopah, Ford.
37504. Tonopah E. & T. Co., Tonopah, Chev.
37505. Highland Cattle Co., Beowawe, Ford.
37506. Highland Cattle Co., Beowawe, Reo.
37507. George A. Perreir, Ely, Saxon 6.
37508. Clyde Munsee, Tecoma, Chevrolet.
37509. John H. Conaway, Caliente, Ford.
37510. H. W. McNeil, Yerington, Pope-Hart.
37511. D. W. Peters, Fallon, Chevrolet.
37512. B. A. Nichols, Fallon, Ford.
37513. H. L. Schreck, Round Mountain, Ford.
37514. W. T. Elliott, Tonopah, Ford.
37515. Nevada Calif. P. Co., Tonopah, Giant.
37516. C. A. Tyler, Las Vegas, Ford.
37517. Nevada G. M. Co., Inc., Luning, Ford.
37518. C. Westermann, Tonopah, Chalmers.
37519. Nick Petrovich, Tonopah, Buick.
37520. W. A. Hess, Manhattan, Ford.
37521. Manual H. Cordova, Reno, Overland.
37522. Howard Nelson, Reno, Ford.

- 37523...Geo. J. Acocks, Sparks, Maxwell.
 37524...E. J. Brown, Tonopah, Chevrolet.
 37525...Smith & Kincart, Reno, Oakland.
 37526...Rudolph Zadow, Eureka, Studebaker.
 37527...W. E. Fuller, Tonopah, Overland.
 37528...W. O. Dressler, Tonopah, Overland.
 37529...C. T. McCally, Eureka, Ford.
 37530...Phillips J. Dolan, Pioche, Ford.
 37531...Phillip Freeze, Goldfield, Ford.
 37532...Walter Frazier, McDermitt, Ford.
 37533...Mrs. O. B. Douglas, Reno, Studebaker.
 37534...Chas. E. Woodward, Tuscarora, Ford.
 37535...Salls Bros., Rowland, Overland.
 37536...J. H. Dearden, Garrison, Utah, G.M.C.
 37537...Mrs. H. Hanley, Reno, Overland.
 37538...A. E. Painter, Reno, Chevrolet.
 37539...Lynn Harris, Elko, Overland.
 37540...Kenneth M. Graham, Wellington, Buick.
 37541...M. M. Wiley, Luning, Reo.
 37542...Ennis Brown & Co., Reno, Dodge.
 37543...Leo. A. McNamee, Las Vegas, Dodge.
 37544...Mrs. May Larson, Tonopah, Dodge.
 37545...Paul S. Ney, Reno, Franklin.
 37546...Earl F. Wright, Arthur, Ford.
 37547...Nick Ginoecchio, Reno, Chevrolet.
 37548...Geo. J. Wright, Virginia City, Reo.
 37549...Don Lewellyn, Reno, Hupmobile.
 37550...R. Herz, Reno, Studebaker.
 37551...L. Querio, Reno, Oakland.
 37552...W. B. Evans, Tonopah, Dodge.
 37553...S. H. Manor, Goldfield, Overland.
 37554...H. A. Burgess, Reno, Chevrolet.
 37555...William Gilbert, Reno, Chevrolet.
 37556...Thos. E. O'Brien, Reno, Buick.
 37557...Victor Jacobson, Midas, Oldsmobile.
 37558...Wm. E. Smith, Reno, Studebaker.
 37559...Anna Collins, Reno, Buick.
 37560...E. Ashton, Fallon, Case.
 37561...Henry Heavrin, Fallon, Ford.
 37562...H. H. Murray, Reno, Maxwell.
 37563...Joseph Honzik, Goldfield, Studebaker.
 37564...L. L. Patrick, Goldfield, Dodge.
 37565...King & Malone, Tonopah, Packard.
 37566...A. Henriques, Tonopah, Ford.
 37567...Silver King D. M. Co., Tonopah, Ford.
 37568...Mrs. J. A. Enos, Reno, Reo.
 37569...A. H. Howe, Reno, Marmon.
 37570...Rapp & Belcher, Tonopah, Ford.
 37571...Pat Mooney, Tonopah, Ford.
 37572...Sam Knight, Ruby Valley, Ford.
 37573...F. J. Greenan, Reno, Dodge.
 37574...J. A. Somers, Mason, Chevrolet.
 37575...J. M. Carl, Hornsilver, Ford.
 37576...George A. Sheldon, Goldfield, Ford.
 37577...George W. Wright, Ely, Chevrolet.
 37578...Mrs. Alice D. Siri, Ely, Ford.
 37579...P. J. Woolman, Arthur, Ford.
 37580...George Jeffery, Fernley, Ford.
 37581...J. W. Cody, Midas, Reo.
 37582...F. J. Oliverius, Winnemucca, Chevrolet.
 37583...M. R. Alberson, Denio, Ore., Buick.
 37584...Edith Allen, Denio, Ore., Ford.
 37585...Richard Eva, Mill City, Ford.
 37586...Jeremy Leavitt, Mesquite, Ford.
 37587...A. C. Hickman, Las Vegas, Ford.
 37588...Mrs. Chas. Trost, Reno, Ford.
 37589...John Romano, Elko, Dodge.
 37590...Orton McDonald, Las Vegas, Dodge.
 37591...A. C. Neilson, Steamboat, Chevrolet.
 37592...Chas. H. McLaughlin, Vya, Saxon 6.
 37593...M. D. Fairchild, Reno, Oldsmobile.
 37594...Florence M. Read, Reno, Dodge.
 37595...R. R. Ferrel, Reno, Ford.
 37596...A. T. Marks, Pioche, Stevens-Duryea.
 37597...Frank T. Dunn, Tonopah, Overland.
 37598...J. S. Weaver, Tonopah, Ford.
 37599...Louis Stodieck, Gardnerville, Lexington.
 37600...Dangberg L. & L. S. Co., Minden, Ford.
 37601...V. S. Leland, Minden, Chevrolet.
 37602...P. Irrars, Gardnerville, Overland.
 37603...Dr. Q. S. Wong, Reno, Hudson.
 37604...Alvin G. Gilko, Tonopah, Ford.
 37605...P. V. Myers, Tonopah, Ford.
 37606...S. C. Root, Goodsprings, Ford.
 37607...Verdi Lumber Co., Verdi, Maxwell.
 37608...L. D. Bryant, Reno, Ford.
 37609...F. S. Smith, Derby, Ford.
 37610...E. A. Blier, McGill, Pullman.
 37611...Adolfo Pallachini, Sparks, Maxwell.
 37612...Dr. R. A. Bowdle, East Ely, Dodge.
 37613...Harry C. Holder, McGill, Oakland.
 37614...Tony Semenza, Sparks, Dodge.
 37615...R. Swartfager, Wells, Studebaker.
 37616...Bill Baltis, Ruth, Nash.
 37617...Dr. Mable K. Young, Austin, Ford.
 37618...C. E. Hall, Battle Mountain, Ford.
 37619...E. J. VanWinkle, Oreana, Paige.
 37620...Mrs. Gertrude Craig, Lovelock, Buick.
 37621...L. Little, Reno, Packard.
 37622...Lewis Bros., Reno, Ford.
 37623...Joe Rigabert, Reno, Ford.
 37624...T. J. Murphy, McGill, Lozier.
 37625...E. Whitstone, East Ely, Saxon 6.
 37626...A. R. Gulley, Wells, Ford.
 37627...Kenneth L. Gabriel, Las Vegas, Nash.
 37628...Leopard Pils, Pioche, Ford.
 37629...Barkham & Sarini, Yerington, Ford.
 37630...Ben Gill, Goldfield, Buick.
 37631...Merritt E. Bailey, Goldfield, Studebaker.
 37632...W. G. Graham, Reno, Ford.
 37633...Sam King, Gerlach, Klieber Truck.
 37634...W. W. Bixby, Reno, Dodge.
 37635...H. D. Sanborn, Reno, Chevrolet.
 37636...E. M. Daffs, Reno, Ford.
 37637...Geo. H. Miller, Reno, Ford.
 37638...Frank Garties, Winnemucca, Studebkr.
 37639...W. K. Eberling, Denio, Ore., Ford.
 37640...A. M. Lebeau, Stillwater, Maxwell.
 37641...Jas. A. Faith, McGill, Studebaker.
 37642...J. D. Miller, Unionville, Ford.
 37643...Dale Reynolds, Jiggs, Overland.
 37644...Geo. F. Tranter, Reno, Buick.
 37645...Joseph Grass, Jr., Silver City, Dodge.
 37646...Sam King, Gerlach, Ford.
 37647...A. H. Murdock, Gerlach, Dodge.
 37648...Mam. Divide M. Co., Tonopah, G.M.C.
 37649...Mrs. Lula Hunt, Tonopah, Ford.
 37650...Collins & Webb, Inc., Tonopah, Ford.
 37651...C. M. Jeanny, Wells, Chevrolet.
 37652...Charlotte M. Hamlyn, Beowawe, Ford.
 37653...W. P. Delaney, Hilltop, Ford.
 37654...A. Ferguson, Ely, Stewart.
 37655...R. A. Ricketts, Mason, Ford.
 37656...Wm. G. Sutherland, Thompson, Ford.
 37657...E. R. Lewis, Las Vegas, Ford.
 37658...W. H. Acklin, Caliente, Ford.
 37659...Ralph Maher, Jarbidge, Ford.
 37660...W. S. Allen, Jarbidge, Dodge.
 37661...Wm. Lawrence, Ely, Ford.
 37662...Mrs. V. S. Cadra, Ely, Dodge.
 37663...Frank Martin, Tonopah, Buick.
 37664...Mrs. H. B. Sherman, Tonopah, Stude.
 37665...E. F. Cota, Tonopah, Buick.
 37666...Harry Millard, Carson City, Brush.
 37667...J. F. Magone, Belleville, Ida., Ford.
 37668...W. M. Woods, Tonopah, Ford.
 37669...E. A. Morton, Reno, Ford.
 37670...H. E. Felton, Middleton, Ida., Reo.
 37671...James Penrod, Elko, Ford.
 37672...William Helth, Arthur, Overland.
 37673...William Hoag, Tuscarora, Ford.
 37674...A. T. Thompson, Winnemucca, Hup.
 37675...G. U. Hall, Winnemucca, Howard.
 37676...Frank Dengora, Winnemucca, Olds.
 37677...Geo. A. Simms, McDermitt, Maxwell.
 37678...Hans Christensen, Lovelock, Ford.
 37679...J. C. Ferretto, Reno, Reo.
 37680...C. Griffin, Reno, Ford.
 37681...D. V. Wightman, Fallon, Buick.
 37682...J. L. Roetticher, Reno, Overland.
 37683...Geo. S. Robison, Osceola, Reo.
 37684...C. C. Turner, Wellington, Oakland.
 37685...Martin Amestoy, Reno, Buick.
 37686...F. A. Read, Reno, Ford.
 37687...H. E. Pierson, Reno, Buick.
 37688...Bruce Connelly, Reno, Buick.
 37689...E. A. Schwab, Owyhee, Ford.
 37690...W. C. Schultz, Elko, Packard.
 37691...Joe Powers, Pioche, Overland.
 37692...J. C. Bradley, Reno, Ford.
 37693...Gilbert Briggs, Carson City, Stearns.
 37694...Claude H. Church, Tonopah, Essex.
 37695...F. L. Young, Tonopah, Pope-Hartford.
 37696...E. R. Price, Reno, Dodge.
 37697...Jeanne L. Sheldon, Reno, Chevrolet.
 37698...Archibald Poultry Co., Reno, Ford.
 37699...T. H. Delano, Sparks, Hupmobile.
 37700...H. P. Aldrich, Fallon, Midland.

37701. Jack Johny, Wonder, Ford.
 37702. Bob Williams, Yerington, Ford.
 37703. N. R. Martin, Yerington, Willys-Knight.
 37704. Giuseppe Dini, Yerington, Ford.
 37705. C. M. Smoot, Carson City, Chevrolet.
 37706. S. G. Lamb, Winnemucca, Reno.
 37707. A. Dufurrena, Denio, Ore. Dorris.
 37708. Dora Lasa, McDermitt, Studebaker.
 37709. Ignacio Albiso, McDermitt, Buick.
 37710. E. L. Spencer, Rawhide, Republic.
 37711. Lloyd Hickerson, Adel, Ore., Saxon 6.
 37712. W. S. Hudson, Jarbidge, King 8.
 37713. Elizabeth North, McGill, Overland.
 37714. E. H. Shurtle, Ruth, Ford.
 37715. Union Mines Co., Union, Overland.
 37716. Henry Winter, White Rock, Oakland.
 37717. Frank Rutherford, North Fork, Dodge.
 37718. Mrs. F. Gori, Sparks, Studebaker.
 37719. V. L. Adams, Reno, Buick.
 37720. August R. Riepe, Ely, Buick.
 37721. C. B. Hotaling, Sparks, Overland.
 37722. Ralph Davis, Fallon, Ford.
 37723. C. J. Woodworth, Delamar, Ford.
 37724. Chas. Farett, Reno, Chevrolet.
 37725. W. B. Winn, Reno, Chevrolet.
 37726. Ogie Swingle, Gerlach, Ford.
 37727. Joe Andersen, Gardnerville, Ford.
 37728. C. V. Cole, Pioche, Ford.
 37729. Earl Hoff, Midas, Ford.
 37730. Walter Van Eaten, Lurline, Ford.
 37731. T. L. Martin, Wells, Saxon.
 37732. Bullhead M. Co., Wells, Reno.
 37733. Oliver Iverson, Gerlach, Ford.
 37734. W. D. Lane, Carson City, Ford.
 37735. Ceyser L. & C. Co., Pioche, Ford.
 37736. T. S. DeArman, Tonopah, Ford.
 37737. Combn. Divide M. Co., Tonopah, Ford.
 37738. Paul Weiss, Tonopah, Buick.
 37739. Harry McNamee, Tonopah, Dodge.
 37740. Thomas Hunt, Tonopah, Overland.
 37741. D. B. Irving, Winnemucca, Studebaker.
 37742. Standard Oil Co., Reno, Cadillac.
 37743. Frank L. Sellstrom, East Ely, Republic.
 37744. Pete Mariluch, Schellbourne, Ford.
 37745. Jake Starke, Ely, Ford.
 37746. E. C. Simons, Ely, Ford.
 37747. James Rosevear, Ruth, Ford.
 37748. W. J. Sinclair, Tonopah, Overland.
 37749. Clio Lumber Co., Reno, Buick.
 37750. Wm. F. Miller, Las Vegas, Ford.
 37751. Geo. T. Saxton, Alamo, Ford.
 37752. Utah Construction Co., Montello, Ford.
 37753. Utah Construction Co., Montello, Fed.
 37754. Utah Construction Co., Montello, Dodge.
 37755. C. A. Lanig, North Fork, Hudson.
 37756. The Mineva M. Co., Fallon, Studebaker.
 37757. Mrs. Lillian Corbett, Reno, Reno.
 37758. J. Brown, Gerlach, Ford.
 37759. McNamara C. M. Co., Tonopah, G.M.C.
 37760. Chris S. McCarthy, Tonopah, Studebaker.
 37761. T. J. Perry, Hawthorne, Ford.
 37762. L. O. Lundy, Winnemucca, Reno.
 37763. Ignacio Lewis, Amos, Ford.
 37764. Mrs. C. E. Sway, Winnemucca, Chev.
 37765. James Hunter, Lovelock, Ford.
 37766. Dan B. Rand, Palisade, Ford.
 37767. Ernest W. Cragin, Las Vegas, Ford.
 37768. Louis O. Cazier, Preston, Ford.
 37769. H. D. Bickham, Reno, Dodge.
 37770. W. E. Smith, Tecoma, Oldsmobile.
 37771. Edwin E. Caine, Elko, Dodge.
 37772. Wm. J. Carrill, Wellington, Chevrolet.
 37773. Divide Mercantile Co., Tonopah, Ford.
 37774. Divide Merc. Co., Tonopah, Cadillac.
 37775. Nevada T. & T. Co., Goldfield, Ford.
 37776. J. M. Healy, Tonopah, Dodge.
 37777. Harry Wagner, Mina, G.M.C.
 37778. Guy Pocock, Tonopah, Dodge.
 37779. Antelope L. & L. Co., Yerington, Ford.
 37780. Geo. L. Langrell, Hawthorne, Dodge.
 37781. J. C. Brumblay, Reno, Ford.
 37782. F. J. Koerner, Battle Mountain, Over.
 37783. L. W. Englert, Elko, Chandler.
 37784. Humphrey Supply Co., Reno, Reno 4.
 37785. C. C. Smith, Reno, Crow Elkhart.
 37786. C. Pardini, Fallon, Ford.
 37787. A. W. Swan, Reno, Dodge.
 37788. Elmer W. Minto, Gerlach, Overland.
 37789. Luke J. McNamee, Pioche, Ford.

37790. E. V. Miller, Mina, Haynes.
 37791. Henry O. Demens, Reno, Reno 6.
 37792. J. G. Kirchen, Tonopah, Hudson 6.
 37793. Julia Mae Lynch, Tonopah, Dodge.
 37794. Operator Divide M. Co., Tonopah, Rep.
 37795. Rogers, Una Drive Motor Truck, Sun-nyvale, Cal., Rogers Una Drive.
 37796. Sam Ginnotti, Tonopah, Hudson 6.
 37797. R. A. Bohne, Lurline, Ford.
 37798. Edgar Dame, Golconda, Chevrolet.
 37799. C. Pini, Reno, Ford.
 37800. Dr. R. H. Richardson, Reno, Oldsmobile.
 37801. A. J. Wright, Reno, Chandler.
 37802. Robert Rae, Reno, Ford.
 37803. H. H. Call, Reno, Overland.
 37804. James Gibson, Cherry Creek, Ford.
 37805. J. S. Canning, Reno, Hudson.
 37806. Alfred Syphus, St. Thomas, Chevrolet.
 37807. Paul Stock, Luning, Dodge.
 37808. Nevada State Police, Carson City, Ford.
 37809. Ginocchio Bros., Reno, Federal.
 37810. F. E. Montgomery, Reno, Chevrolet.
 37811. Sam Imelli, Gardnerville, Dodge.
 37812. E. Johnson, Reno, Ford.
 37813. C. E. Jones, Mound House, Oakland.
 37814. T. J. Flynn, Tonopah, Nash.
 37815. F. Faulkner, Bonnie Claire, Ford.
 37816. W. J. Webster, Reno, Ford.
 37817. Wm. Teller, Owyhee, Ford.
 37818. J. N. Bradish, Wells, Buick.
 37819. J. B. Minoletti, Eureka, Studebaker.
 37820. Julius Minoletti, Eureka, Ford.
 37821. S. Quillic, Eureka, Willys-Knight.
 37822. Wm. Moore, Strawberry, Dodge.
 37823. John C. Murray, Dyke, via Amos, Ford.
 37824. John Francis Virginia City, Ford.
 37825. Tom Hendry, Reno, Ford.
 37826. J. H. Smith, Reno, Ford.
 37827. George Bailey, Gerlach, Ford.
 37828. D. Duval, East Ely, Ford.
 37829. E. C. Collins, Reno, Ford.
 37830. Highway Dept., Carson City, Buick.
 37831. Highway Dept., Carson City, Ford.
 37832. Highway Dept., Carson City, Ford.
 37833. Joe Munis, Winnemucca, Oldsmobile.
 37834. Victor Vubiet, Amos, Reno 6.
 37835. B. J. Loinaz, Winnemucca, Studebaker.
 37836. C. W. Ingram, Denio, Ore., Ford.
 37837. P. A. Mink, Denio, Ore., Ford.
 37838. Louis Raymond, Midas, Ford.
 37839. Mark R. Averill, Tonopah, Dodge.
 37840. Dr. Sweet, Gardnerville, American.
 37841. Ed. Johns, Tonopah, Ford.
 37842. Dr. Geo. A. Carr, Reno, Studebaker.
 37843. M. G. Farnsworth, Ely, Reno.
 37844. Jube J. Wright, Elko, Ford.
 37845. Mary E. Winter, White Rock, Dodge.
 37846. J. M. Mitchell, Reno, Ford.
 37847. D. A. Whitaker, Reno, Buick.
 37848. Wm. P. Seeds, Reno, Studebaker.
 37849. W. D. Mason, Elko, Reno.
 37850. E. L. Belcher, Elko, Oakland.
 37851. Geo. Chamberlain, Reno, Ford.
 37852. J. L. Campbell, Genoa, Studebaker.
 37853. B. A. Adam, Reno, Ford.
 37854. Crown Point G. M. Co., Johnny, Ford.
 37855. Highway Dept., Carson City, Ford.
 37856. V. S. Connell, Wellington, Cadillac.
 37857. E. H. Bath, Carson City, Ford.
 37858. John A. Stewart, Tonopah, Studebaker.
 37859. Mrs. E. Hays, Arthur, Ford.
 37860. Salls & Salls, Rowland, Republic.
 37861. June E. Huston, McGill, Maxwell.
 37862. Mrs. J. R. Swindell, Reno, Chevrolet.
 37863. F. H. Hartung, Reno, Reno.
 37864. E. R. Bailey, Koop, Chevrolet.
 37865. Ben Hur Divide M. Co., Tonopah G.M.C.
 37866. Alexander Egenes, Mill City, Buick.
 37867. Robert Ray, Searchlight, Hupmobile.
 37868. J. P. Shea, Sparks, Ford.
 37869. Andrew Berg, Midas, Ford.
 37870. J. M. Wyatt, Midas, Ford.
 37871. Harry Lee McCall, Elko, Dodge.
 37872. Charley Hood, Elko, Oldsmobile.
 37873. Mrs. P. Vetter, Elko, Overland.
 37874. Geo. A. Scott, Reno, Hudson.
 37875. Alberto Capuro, Sparks, Oakland.
 37876. James Block, Reno, Studebaker.
 37877. J. E. Martin, Reno, Ford.

- 37878...Mrs. L. V. Carter, Reno, Ford.
 37879...E. E. Watson, Sparks, Studebaker.
 37880...Roy Williams, Sparks, Ford.
 37881...Ray French, Tonopah, Chandler.
 37882...Geo. Wilson, Elmore, Jr., Elko, Dodge.
 37883...E. A. Quill, Carson City, Studebaker.
 37884...Paul H. Quick, Goldfield, Oakland.
 37885...J. H. Wilson, Lovelock, Overland.
 37886...A. J. Boast, Sparks, Ford.
 37887...Willis W. Caffery, Reno, Studebaker.
 37888...G. W. Hall, Indian Springs, Dodge.
 37889...H. C. Lamott, Goodsprings, Maxwell.
 37890...Dave Radley, Wellington, Ford.
 37891...J. D. Oliver, Nixon, Lexington.
 37892...H. A. Taylor, Mill City, Ford.
 37893...Juan Jaca, McDermitt, Ford.
 37894...Ernest G. Thomsen, Denio, Ore., Ford.
 37895...Geo. A. Gomes, Golconda, Cadillac.
 37896...First Natl. Bank, Winnemucca, Buick.
 37897...Maurice B. Cross, Elko, Chevrolet.
 37898...Wm. Trembath, Midas, Ford.
 37899...Stephens L. & S. Co., Wells, Ford.
 37900...A. C. Lyon, Wells, Ford.
 37901...E. K. Fowler, Reno, Overland.
 37902...Joe Gilbert, Wells, Cadillac.
 37903...George L. Ullom, Lovelock, White.
 37904...Chas. W. Goodrich, Tonopah, Ford.
 37905...Homestake Divide M. Co., Tonopah, Fd.
 37906...J. A. Currans, Tonopah, Ford.
 37907...Divide City M. Co., Tonopah, Ford.
 37908...Ben Hur Divide M. Co., Tonopah, Ford.
 37909...Keystone Divide M. Co., Tonopah, Ford.
 37910...C. E. Sullivan, Mina, Ford.
 37911...Mina Mercantile Co., Mina, Ford.
 37912...Fred Braito, Gerlach, Ford.
 37913...E. J. Trost, Heinz, Ford.
 37914...A. F. Dunbar, Fort Churchill, Ford.
 37915...E. R. Mattinson, Las Vegas, Reo.
 37916...J. J. Jakowatz, Goldfield, Dorris.
 37917...Dossa L. Smith, Tonopah, Ford.
 37918...Dee Clark, Tonopah, Ford.
 37919...Hugh H. Brown, Tr., Tonopah, Ford.
 37920...W. R. Weber, Overton, Dodge.
 37921...Mrs. J. B. Gheen, Elko, Oakland.
 37922...J. D. Mercer, Imlay, Ford.
 37923...J. E. McDermott, Reno, Oldsmobile.
 37924...A. N. Therien, Fallon, Chevrolet.
 37925...Geo. G. Gans, Vya, Ford.
 37926...W. K. Nelson, Reno, Essex.
 37927...P. V. Perkins, Carrara, Ford.
 37928...Frank W. Wallace, Las Vegas, Velie.
 37929...Gray-Reid Co., Fallon, Oldsmobile.
 37930...James Adrain, Winnemucca, Chandler.
 37931...T. G. Davis, Kimberly, Dodge.
 37932...Dr. J. E. Worden, Elko, Chevrolet.
 37933...Jay Ball, Bullion, Chevrolet.
 37934...Kirk Cornwall, Tuscarora, Mack.
 37935...Geo. W. Garat, White Rock, Buick.
 37936...H. R. Irland, Tuscarora, Ford.
 37937...Wm. E. Abbott, Mesquite, Ford.
 37938...Chas. E. Hines, Goldfield, Maxwell.
 37939...Troy Bell, Pioneer, Ford.
 37940...Assoc. Oil Co. of Nev., Reno, Republic.
 37941...Harriet D. Weir, Tonopah, Oakland.
 37942...Edw. C. Boston, Eureka, Saxon.
 37943...Neil P. Plummer, Eureka, Overland.
 37944...C. E. Harris, Garrison, Utah, Ford.
 37945...Lyman P. Seath, McGill, Maxwell.
 37946...Mrs. S. E. McGinniss, Mtn. City, Olds.
 37947...F. A. Strauss, Virginia City, Chevrolet.
 37948...C. D. Lamar, Tuscarora, Saxon.
 37949...W. G. Edwards, Reno, Chevrolet.
 37950...C. H. Stoddard, Reno, Chevrolet.
 37951...John Gnocchio, Reno, Reo.
 37952...Robert Jones, Contact, Buick.
 37953...G. Georgetta, Ibadah, Ford.
 37954...James Kane, Gardnerville, Abbott.
 37955...Chas. McKensie, Mound House, Oak.
 37956...S. G. Basta, Ely, Hudson 6.
 37957...E. W. Clays, McGill, Dodge.
 37958...F. F. Owens, Ely, Dodge.
 37959...J. L. Teis, Ely, Buick.
 37960...Frank Shipp, Shoshone, Ford.
 37961...Ray Gubler, Lund, Ford.
 37962...W. B. Maxwell, Tonopah, Ford.
 37963...Albert Roselund, Schellbourne, Reo.
 37964...Harry Thompson, Winnemucca, Over.
 37965...N. Harmony M. Co., Winnemucca, Chev.
 37966...Boggio & Forgnone, Paradise, Ford.
 37967...J. H. Playter, Golconda, Ford.
 37968...Fred Hummel, Jungo, Ford.
 37969...Florence Divide M. Co., Tonopah, Ford.
 37970...Geo. L. Harma, Tonopah, Ford.
 37971...A. G. Hupfel, Reno, Studebaker.
 37972...J. L. Denton, Caliente, Ford.
 37973...W. H. Braden, Goldfield, Ford.
 37974...H. G. McMahon, Goldfield, Buick.
 37975...Walter Johnson, Currant, Ford.
 37976...C. H. Burner, Elko, Ford.
 37977...Webster Patterson, Elko, Chevrolet.
 37978...A. L. J. Clark, Las Vegas, Universal.
 37979...Leonard Fritz, Mina, Oakland 4.
 37980...Ed. Smiley, Deeth, Buick.
 37981...Walter Renfrow, Lamolle, Overland.
 37982...Nev. Natl. I. C. S. Co., Las Vegas, Rep.
 37983...G. R. Burnham, McGill, Chalmers.
 37984...Mrs. Nellie Lawrence, Tonopah, Stude.
 37985...Union Honey Co., Wabuska, Ford.
 37986...Union Honey Co., Wabuska, Ford.
 37987...Union Honey Co., Wabuska, Ford.
 37988...Union Honey Co., Wabuska, Ford.
 37989...Union Honey Co., Wabuska, Ford.
 37990...H. R. Warren, Wabuska, Ford.
 37991...H. R. Warren, Wabuska, Ford.
 37992...F. W. Lockman, Unionville, Buick.
 37993...F. F. Garside, Tonopah, Buick.
 37994...Etchemendy Bros., Eureka, Dodge.
 37995...Frank Fagan, Carlin, Ford.
 37996...F. L. Summerfield, Mina, Oakland.
 37997...John Larson, Fallon, Ford.
 37998...Chas. Johnson, Reno, Ford.
 37999...Balbino Achabal, Tuscarora, Hudson 6.
 38000...J. H. Pierce & D. Jones, Tonopah, Fd.
 38001...Ely Racheff, Tonopah, Cadillac.
 38002...D. S. West, Bonnie Claire, Ford.
 38003...Mary Kennedy, Bonnie Claire, Ford.
 38004...C. L. Hargrave, Genoa, Chevrolet.
 38005...Judson J. R. Smith, Yerington, Reo.
 38006...Fred Remick, Tonopah, Ford.
 38007...Gus Gekis, Kimberly, Michigan.
 38008...John Pasheo, Smith, Ford.
 38009...F. M. Macy, Midas, Ford.
 38010...H. M. Gillham, Reno, Chevrolet.
 38011...Steve Korppen, Ruth, Willys-Knight.
 38012...J. L. Ohearn, Reno, Ford.
 38013...A. W. Bowman, San Jacinto, Buick 6.
 38014...Sam Knight, Ruby Valley, Hudson.
 38015...Morley Griswold, Elko, Chevrolet.
 38016...Holden M. & M. Co., Tuscarora, Mack.
 38017...B. A. Houks, Contact, Hupmobile.
 38018...Dan Heineman, Tonopah, E.M.F.
 38019...Chas. Treacartes, Lamolle, Ford.
 38020...Independent Market, Elko, Dodge.
 38021...W. S. Bieroth, Rowland, Dodge.
 38022...H. E. Bathurst, Reno, Ford.
 38023...Peter Vincigaerra, Reno, Buick.
 38024...W. F. McCarty, Dayton, Ford.
 38025...Water Bell, Yerington, Dorris.
 38026...B. L. Anderson, Tonopah, Patriotic.
 38027...B. L. Anderson, Tonopah, Ford.
 38028...Robert Donovan, Tonopah, Essex.
 38029...W. L. Fuller, East Ely, Dodge.
 38030...Henry M. Fuller, East Ely, Dodge.
 38031...T. D. Leavitt, Jr., Las Vegas, Ford.
 38032...Goldfield G. B. M. Co., Goldfield, Dodge.
 38033...Paul B. Missiner, Mina, Auburn 6.
 38034...Mike Wilkins, McDermitt, Grant 6.
 38035...Angelo Depoali, Eureka, Ford.
 38036...Carson & Allapach, Reno, Studebaker.
 38037...Oscar M. Emery, Sparks, Ford.
 38038...Wm. M. Fuller, Reno, Chevrolet.
 38039...H. Goldstein, Reno, Ford.
 38040...J. J. Spalding, Reno, Ford.
 38041...Geo. F. Coleman, Reno, Ford.
 38042...Mrs. W. C. LaBee, Thompson, Overland.
 38043...W. T. Critchfield, Winnemucca, Dodge.
 38044...M. Anderson, Golconda, Buick.
 38045...Jaun Jaca, McDermitt, Reo.
 38046...J. V. Button, Winnemucca, Buick.
 38047...Dr. Roy W. Martin, Las Vegas, Cadillac.
 38048...R. L. McBain, Las Vegas, Ford.
 38049...S. W. Waring, Searchlight, Buick.
 38050...J. A. Schas, McDermitt, Ford.
 38051...Abie & Curtner, Willow Point, Ford.
 38052...J. A. Schas, McDermitt, H. & L.
 38053...Mrs. Dave Abel, Winnemucca, Allen.

- 3-054 Royal Divide M. Co., Tonopah, G.M.C.
 3-055 Frank Howard, Carson City, Ford.
 3-056 E. N. Griffin, McGill, Chandler.
 3-057 H. Luhrs, Dayton, Ford.
 3-058 E. E. Smith (No. 3646 lost in transit,
 No. 38058 sent in place).
 3-059 Isabel Murphy, Pioche, Maxwell.
 3-060 W. R. Gilkey, Eureka, Ford.
 3-061 G. A. Boyce, Whiterock, Palmer Singer.
 3-062 R. E. Job, Sparks, Hupmobile.
 3-063 Gust Zafiris, Kimberly, Chandler.
 3-064 Simon Mina M. Co., Tonopah, Dodge.
 3-065 J. H. Broach, Verdi, Ford.
 3-066 Henry Cordes, Genoa, Buick.
 3-067 C. Barego, Reno, Pilot 6.
 3-068 J. B. Fayant, Golconda, Packard.
 3-069 Theodore Martinez, Amos, Dodge.
 3-070 P. E. Day, Bonnie Claire, Ford.
 3-071 Joe Garcia, Denio, Ore., Ford.
 3-072 Modesto Mayayo, Denio, Ore., Oldsmo.
 3-073 Migrel Larrogeta, Winnemucca, Oldsmo.
 3-074 Roy L. Primeaux, Tuscarora, Nash.
 3-075 Roy L. Primeaux, Tuscarora, Nash.
 3-076 H. S. Gallaway, Thompson, Ford.
 3-077 W. F. Ernest, Tonopah, Studebaker.
 3-078 J. C. Bradley, Reno, Ford.
 3-079 W. A. Wiser, Reno, Studebaker.
 3-080 A. Benedetti, Lovelock, Pope Hartford.
 3-081 W. T. Geraghty, Ely, Buick.
 3-082 Albert Gee, Preston, Ford.
 3-083 A. W. Brooks, Reno, Overland.
 3-084 Pete Henrichs, Yerington, Ford.
 3-085 George Mohatt, Lovelock, Ford.
 3-086 Theodora W. Longabaugh, Reno, Stude.
 3-087 Bud Lyon, Metropolis, Ford.
 3-088 J. R. Bradshaw, Paradise, Reo.
 3-089 Ervin Elges, Gardnerville, Maxwell.
 3-090 W. M. Kearney, Reno, Pope Hartford.
 3-091 Walter Shores, Reno, Ford.
 3-092 P. E. Cota, Reno, Ford.
 3-093 Pio Caciara, Reno, Ford.
 3-094 W. C. Morgan, Las Vegas, Ford.
 3-095 P. F. Beardsley, Tonopah, Stearns Kt.
 3-096 Ernest Beckert, Virginia City, Reo 6.
 3-097 Chas. E. Arnold, Reno, Dodge.
 3-098 W. C. Lamson, Reno, Ford.
 3-099 Floyd Jewkes, Lurline, Studebaker.
 3-100 John F. Murphy, Elko, Overland.
 3-101 Standard Oil Co., Reno, Mack.
 3-102 Sidney Harris, Cedarville, Calif., Ford.
 3-103 E. L. Holbrook, Midas, Ford.
 3-104 Geo. L. Boulware, Midas, Stutz.
 3-105 F. C. Gladding, Reno, Flanders.
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 38325...S. L. Woodward, Fallon, Overland.
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LIST OF DEALERS' LICENSES FOR QUARTER ENDING JUNE 30, 1919

Make of vehicle is given last.

D-4300...Smith Valley Merc. Co., Wellington— Chalmers.	D-5507....H. R. Brinsmead, Reno—Auburn 6.
D-4350...McIntosh Motor Sales Co., Reno— Oldsmobile.	D-5541....Plaza Garage Company, Ely—Over- land, Essex, Hudson, Nash, Nelson.
D-4550...Mason Valley Implement Co., Yering- ton—Chevrolet.	D-5555....Carrico & Anderson, Reno—Nash.

LIST OF MOTORCYCLE LICENSES FOR QUARTER END- ING JUNE 30, 1919

Make of vehicle is given last.

1068...Gregorio Legaspi, Sparks, Excelsior.	1086...Guido Donati, Reno, Indian.
1069...G. Belluomini, Elko, Miami.	1087...T. S. Franklin, Yerington, Indian.
1070...A. P. Roberts, Reno, Indian.	1088...Mario Masini, Reno, Indian.
1071...J. A. McKenzie, Reno, Thor.	1089...James A. Jensen, Reno, Harley-Dav.
1072...Geo. Eastwood, Deeth, Excelsior.	1090...Lawrence Semenza, Reno, Harley-Dav.
1073...J. D. Kramer, Las Vegas, Harley-Dav.	1091...W. H. Oden, Reno, Indian.
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1075...Leslie Marker, Lovelock, Indian.	1093...C. B. Nelson, Sparks, Indian.
1076...Johnnie Decker, Round Mtn., Indian.	1094...Reno Motorcycle Repair Shop, Reno— Second-hands.
1077...Willie Darrough, Round Mtn., Indian.	1095...J. T. Anderson, Reno, Indian.
1078...E. B. Powell, Reno, Indian.	1096...H. B. Phelps, Reno, Indian.
1079...W. Walker, Genoa, Indian.	1097...Walter Poirier, Genoa, Excelsior.
1080...Arthur Walker, Genoa, Shears.	1098...Wm. H. Howard, Fallon, Harley-Dav.
1081...H. I. Talcott, Lovelock, Indian.	1099...Arthur Heovner, Ruth, Harley-Dav.
1082...Bortolo Zanotti, Reno, Indian.	1100...Johnnie Arch, Round Mtn., Indian.
1083...John Pacheco, Carson City, Indian.	1101...Harvey B. Child, Reno, Indian.
1084...Axel Olsen, Lovelock, Indian.	
1085...Jacob Mischon, Reno, Johnson.	



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JUDGING AND COMMERCIAL GRADING OF SMALL GRAINS AND HAY

(New Edition—Revised)

By

CHARLES S. KNIGHT, B.S.

Dean of the College of Agriculture
Head of the Department of Agronomy



Common Types of Wheat, including, from left to right, Colorado No. 50, Defiance, Bluestem, New Zealand, White Club, and Marquis.

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¹On leave of absence, 1919-1920.

²On leave for war service, 1917-1919.

³On leave for war service, 1918-1919.

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JUDGING AND COMMERCIAL GRADING OF SMALL GRAINS AND HAY

By CHARLES S. KNIGHT

Dean of the College of Agriculture, and Professor of Agronomy

STUDY OF WHEAT

Classification of the Different Types of Wheat

1. **EINKORN** (*Tr. monococcum* L.). This species is distinguished from the other species by the palea falling off into two pieces, and the joints of the rachis separating readily at maturity. Each spikelet is awned and the spike is compact, and usually only the lower flower of the spikelet matures. The spikelets are 3-flowered, but 1-grained. The cultivation of this wheat is of great antiquity, tracing back to the stone age. It is not a good bread wheat, but is used for mush and cracked wheat, and as a fodder for cattle.

2. **SPELT** (*Tr. sativum spelta*). Has a darkish color when ripe. The spikes are long and very loose; the spikelets are 3-seeded at base and 2-seeded at top of spike; the grain is held in the spike. This species was widely grown in ancient times, being the chief grain in Egypt and Greece, but is now used chiefly as a stock food.

3. **EMMER** (*Tr. sat. dicoccum*). The spikelets of emmer differ principally from those of spelt in the presence of a short pedicel. This pedicel, which is really a portion of the rachis, if present in spelt, is always very blunt and much thicker. Also the emmer spikelets are flattened on the inner side, and not arched as in spelt, so that they do not stand out from the rachis as the spelt spikelets do, but lie close to it and to each other, forming a compact head. The spikelets are 2-seeded, one seed being located a little higher than the other. The outer chaff is boat-shaped, keeled and toothed at the apex. The grain differs from spelt in that it is redder in color, usually harder, and more compressed at the sides.

4. **COMMON WHEAT** (*Tr. sat. vulgare*). Has 4-flowered spikelets which are 3-seeded; both bearded and beardless. This is the variety most commonly grown throughout the wheat sections of the world, due to its high yielding power and its excellency for bread-making.

5. **CLUB OR SQUAREHEAD WHEAT** (*Tr. sat. compactum*). Sometimes called Hedgehog or Dwarf wheat. This type differs from Common wheat in the shortness and compactness of the head, and the shortness and stiffness of the straw. The spikes are distinctly 4-sided; both bearded and beardless. This wheat is less liable to lodge and shatter than the Common wheat, and is grown chiefly in the Pacific Coast States, where the wheat stands on the field for some time after it is ripe, and is harvested with a combined header and thresher.

6. **POULARD WHEAT** (*Tr. sat. turgidum*). Is grown chiefly in the hot

dry regions bordering the Mediterranean and Black Seas. It is often difficult to distinguish this type from Durum wheat, which it closely resembles. It differs however from Durum wheat in having a broader spike, shorter awns, shorter and less dense grains, and stiffer straw. The spikes are large, dense, 4-sided, 2- or 3-seeded, and bearded.

7. DURUM WHEAT (*Tr. sat. durum*). Often called Macaroni Wheat. The spikes are more heavily bearded than on Common wheat, and the plants somewhat resemble barley. The spikelets are from 3- to 4-seeded, with long stiff awns. The spikes are also large, and vary in color from a light yellow to almost black, depending upon the variety. The kernels are large, glossy, and very hard, containing less starch than the Common wheat.

8. POLISH WHEAT (*Tr. polonicum*). This species may be distinguished by the palea of the lowest flower, which is half as long as the flowering glume. The outer glumes are as long or longer than any of the flowering glumes, while in common varieties the outer glumes are shorter. The spikes are large and open; the spikelets are 2- or 3-sided, bearded, and close to the rachis; the grains are large, somewhat resembling rye. The glumes are bluish-green in color.

LABORATORY STUDY OF THE WHEAT PLANT

The student should be provided with as many of the above types of wheat as possible, and the following outline should be used in describing the different parts of the head of wheat.

SPIKE OF WHEAT—

1. Length of spike: Take average of 5 spikes from base of lower spikelet to tip of apical flowering glume, nor counting awn.....
 2. Compactness of spike: Very open, open, medium, compact, crowded.....
 3. Shape of spike:
 - a. Side view—Tapering toward apex, tapering both ways, uniform (same diameter throughout), clubbed (heads larger at apex than below).....
 - b. End view—Square, flattened with spikelets (diameter of head through spikelets is least), flattened across spikelets (diameter of head through spikelets is greatest).....
 4. Sterile spikelets: Number at tip and base of spike.....
 5. Color of spike: Whitish; yellow; yellow brown; rosy; red; bluish; brown; black.....
- Make the following determinations on the spike of wheat:
6. Number of spikelets in a spike.....
 7. Number of flowers in each spikelet.....
 8. Number of grains in the whole spike.....
 9. Determine the number and arrange weight of grains occupying 1st, 2d, 3d, and 4th places from the rachis.....
 10. Number of empty glumes in spikelet.....
 11. Make a sketch of the empty glume showing the beak, shoulder, keel, and nerve.....
 12. Make a sketch of the palea and flowering glume, showing how they differ.....
 13. Make a sketch of the rachis, showing the attachment of the spikelet by means of the rachilla.....

AWNS OF WHEAT—

1. Length: Long (4 in. or more), medium (2 to 4 in.), short (2 in. or less).....

2. Relative position of awns and spike: Parallel, spreading, widely spreading.....
3. Size: Slender; medium; stout.....
4. Relative power of holding to spikelet: Deciduous (awns falling as soon as grain is mature), partly deciduous, persistent (awns not falling off naturally).....
5. Color: Light yellow; yellow; brown; black.....

SPIKELET OF WHEAT—

1. Relative width: Spreading widely; spreading; narrow.....
2. Number of grains.....
3. Outer glumes:
 - a. Hairy; partly hairy; smooth.....
 - b. Length: Long (as flowering glume); medium; short; wanting.....
 - c. Width: Broad; medium; narrow.....
 - d. Color: White; brown.....
 - e. Attachment to rachilla: Firm; medium; weak.....
 - f. Beak of outer glume: Long; medium; short.....
 - g. Shoulder of outer glume: Broad; medium; narrow.....
 - h. Shoulder of outer glume: Square; sloping; round.....

THE GRAIN OF WHEAT—

1. Density: Very hard; hard; medium; soft; very soft.....
(Density determined by cutting several grains and examining their interior).
2. Gluten or starch: Very horny; horny; dull; starchy (cross-section).....
3. Weight of 100 grains: a. b.
4. Ratio of length to width: Divide length of 25 grains by width of 25 grains with crease down.....
5. Shape: Straight; curved; pear shaped.....
6. Plumpness: Plump; medium; shriveled.....
7. Cheeks: Fat; plump; angular.....
8. Tip: Pointed; blunt.....
9. Base: Pointed; blunt.....
10. Crease:
 - a. Depth: Deep; medium; shallow.....
 - b. Width: Wide; medium; narrow.....
11. Brush:
 - a. Area: Large; small.....
 - b. Length of hairs: Long; short.....
12. Color of grain: Light yellow; yellow; clear; amber; dull amber; clear red; dull red.....
13. Make sketch of kernel, showing crease, cheek and brush.
14. Make sketch of cross-section of kernel, showing crease and cheek.

Gluten Test of Wheat Flour

Take one ounce of wheat flour and use just water enough to mix up into a stiff ball of dough. Cover the ball of dough with lukewarm water and let stand for fifteen minutes. Then work the dough with the fingers and wash out the starch, using fresh water, until the water remains clear. The gluten remains in a mass. Squeeze the gluten to remove all excess water, and weigh. Multiply this weight by 100, and the result will be the percentage of wet gluten in the sample of flour.

The quality of gluten may be determined by working the wet gluten into a very thin sheet. Gluten of high quality will have the appearance of thin rubber being stretched, while poor quality gluten lacks this elasticity and breaks like rotten rubber when stretched.

NEVADA COLLEGE OF AGRICULTURE
DEPARTMENT OF AGRONOMY

STUDENT'S SCORE-CARD

WHEAT

Name of Scorer..... Date.....

Number of Exhibit..... Name of Variety.....

	Perfect Score	Student's Score	Correct Score
<i>Trueness to Type or Breed Characteristics—</i>			
1. Uniformity.....	10		
2. Freedom from mixture with other grains.....	10		
3. Color of grain.....	10		
4. Size of kernel.....	5		
5. Shape of kernel.....	5		
6. Gluten or Starch :			
Amount of gluten indicated by hardness of kernel.....			
Amount of starch indicated by softness of kernel.....	10		
<i>Market Condition—</i>			
1. Per cent of damaged, smutty or musty kernels...	10		
2. Weight per bushel.....	10		
3. Per cent of weed seed, dirt and other foreign matter.....	10		
4. Moisture content.....	5		
5. Vitality and maturity.....	15		
Total.....	100		

Commercial grade.....

Designate weed seeds in samples :

STANDARDS OF PERFECTION—WHEAT

Name of variety	Type	Length of grain, inches	Thickness of grain, inches	Shape and plumpness of grain	Color	Moisture content, per cent	Weight per bushel, pounds	Gluten, per cent hard	Starch, per cent soft
Turkey Red	Red, hard winter	$\frac{3}{16}$ to $\frac{1}{4}$	$\frac{1}{16}$ to $\frac{1}{8}$	Plump, slightly flattened sides, medium groove	Clear, dark amber	10	62	90	.....
Fultz	Red, soft winter	$\frac{7}{16}$ to $\frac{1}{2}$	$\frac{1}{16}$ to $\frac{1}{8}$	Very plump, rounded sides, shallow groove	Dull, reddish white	10	60	.....	90
Marquis	Red, hard spring	$\frac{3}{16}$ to $\frac{1}{2}$	$\frac{1}{16}$ to $\frac{1}{8}$	Very plump, deep groove	Clear, medium amber	10	62	90	.....
Bluestem	White, half hard spring	$\frac{7}{16}$ to $\frac{1}{2}$	$\frac{1}{16}$ to $\frac{1}{8}$	Plump, slightly flattened sides, medium groove	Dull white	10	60	.....	70
Kubanka	Durum, very hard	$\frac{3}{16}$ to $\frac{1}{2}$	$\frac{1}{16}$ to $\frac{1}{8}$	Medium plump, slightly flattened sides, medium groove	Clear, light amber	10	64	95	.....
White Australian	White, half hard spring or winter	$\frac{7}{16}$ to $\frac{1}{2}$	$\frac{1}{16}$ to $\frac{1}{8}$	Medium plump, slightly flattened sides, medium groove	White	10	61	.....	70
White Club	White, soft spring	$\frac{7}{16}$ to $\frac{1}{2}$	$\frac{1}{16}$ to $\frac{1}{8}$	Very plump, rounded sides, shallow groove	White	10	60	.....	90

WHEAT

Points To Be Observed and Rules for Judging Wheat

Trueness to Type or Breed Characteristics—

1. All kernels of the samples should resemble one another in size, shape, color, and hardness. Take 100 kernels, constituting a fair sample of grain. Count out the kernels not true to type. For each kernel off type, cut $\frac{1}{10}$ point.

2. The sample should contain no mixture of oats, barley, or any other grain. Weigh the whole sample, separate and weigh the foreign grain. Divide the weight of the foreign grain by the weight of the whole sample. This will give the percentage of other grains. For every per cent so found, cut $\frac{1}{2}$ point.

3. Grain should all be the same color; no mixture of red and white kernels. For discoloration, cut according to extent. If only slightly discolored, cut $\frac{1}{4}$ point, and more according to judgment.

4. Kernels should be of the same size throughout to secure uniformity. Take a fair sample of 100 kernels. For every per cent of grain not conforming to the standard size, cut $\frac{1}{10}$ point.

5. Kernels should be of the same shape throughout the sample, and should conform to the standard of the variety. For every per cent of poorly shaped grain, cut $\frac{1}{10}$ point.

6. Gluten or Starch, as indicated by the hardness and color. The amount of gluten and starch should conform to the standard of the variety. For every per cent short of standard, cut $\frac{1}{4}$ point.

Market Condition—

1. The sample should be free from smutty, musty, or bin-burned kernels. Take an average sample of 100 kernels and count the number of smutty or otherwise damaged kernels. Cut sample 1 point for each per cent of smutty, bin-burned, or musty kernels.

2. Good wheat should weigh 60 or more pounds to the measured bushel. The weight per bushel should be tested with a standard weigher. Cut 1 point for each pound below the standard weight of the variety.

3. The sample should be free from any kind of dirt or weed seeds. The percentage of foul material is determined by sieves and scales. Remove and weigh the foul material. Divide the weight of the foul material by the weight of the whole sample. This will give the percentage of foul material. Should the foul material consist of noxious seeds, the cut on the sample should be made more severe than if composed of practically harmless material. Cut 1 point for each per cent of foul material.

4. The moisture content can be judged approximately by touch. For an accurate determination, weigh out 10 grams of grain, dry thoroughly in a drying oven. Reweigh and determine the percentage of loss in weight. This will give the per cent of moisture in the sample. For every per cent of moisture in excess of standard, cut $\frac{1}{2}$ point.

5. Wheat should give a germination of not less than 95 per cent. (Make germination test.) Cut $\frac{1}{2}$ point for each per cent the germination falls below 95 per cent.

STUDY OF OATS

Variety of Oats—

Oats may be classified, according to their date of ripening, as Spring or Winter, according to the color and shape of grain, and according to the shape of the panicle. In the last class are two distinct types: The Common Oats (*Avena sativa*), which includes those varieties having spreading panicles, and Tartarian Oats (*Avena orientalis*), which includes varieties having close erect panicles, commonly called Side Oats.

With hullless oats (*Avena nuda*), found in both the Common and the Tartarian varieties, the hull is removed in threshing. The hulled varieties are also divided according to the color of the hull into white, gray, red, and black oats.

LABORATORY STUDY OF MATURE OAT HEAD

PANICLE—

1. Length of panicle: Average of 5 panicles from base of lower whorl to tip of flowering glume of upper spikelet.....
2. Number of whorls: Average of 5 panicles.....
3. Number of main branches: Average of 5 panicles.....
4. Number of grains: Average of 5 panicles.....
5. Weight of grains: Average of 5 panicles..... Weight of 100 grains.....
6. Shape: Open; spreading; compressed; side panicle.....
7. Color: White; yellow; yellowish brown; red; black; gray.....

SPIKELET—

1. Number of spikelets: Average of 5 panicles.....
2. Shape: Spreading; narrow.....
3. Variation in length of pedicel..... to.....
4. Number of grains per spikelet.....
5. Relative size of lower and upper grains of spikelet: Weight of 25 lower grains..... weight of 25 upper grains.....

THE GRAIN—

1. Per cent of meat to hull: Weight of 100 grains..... weight of 100 kernels..... per cent of kernel.....
2. Plumpness: Plump; medium; inflated.....
3. Flowering glume: Thick; medium; thin.....
4. Length of kernel: 25 kernels from base to tip of flowering glume.....
Length of grain: 25 grains from base to tip of flowering glume.....
5. Color: Light yellow; yellow; gray; reddish brown; black.....
6. Crease: Full; deep.....
7. Make a sketch of a spikelet of oats, showing empty glume, adherent glume palea, kernel, awn, and sterile flower.

NEVADA COLLEGE OF AGRICULTURE
DEPARTMENT OF AGRONOMY

STUDENT'S SCORE-CARD

OATS

Name of Scorer..... Date.....
Number of Exhibit..... Name of Variety.....

	Perfect Score	Student's Score	Correct Score
<i>Trueness to Type or Breed Characteristics—</i>			
1. Uniformity.....	10		
2. Freedom from mixture with other grains.....	10		
3. Color of grain.....	5		
4. Size of kernel.....	5		
5. Shape of kernel.....	5		
6. Proportion of meat to hull.....	10		
<i>Market Condition—</i>			
1. Per cent of damaged, smutty or musty kernels...	10		
2. Weight per bushel.....	10		
3. Per cent of weed seed, dirt and other foreign matter.....	15		
4. Moisture content.....	5		
5. Vitality and maturity.....	15		
Total.....	100		

Commercial grade.....

Designate weed seeds in samples :.....

STANDARDS OF PERFECTION—OATS

Name of variety	Type	Length of grain, inches	Thickness of grain, inches	Shape and plumpness of grain	Color	Moisture content, per cent	Weight per bushel, pounds
Sixty-Day	Yellow	$\frac{1}{8}$ to $\frac{1}{4}$	$\frac{1}{8}$ to $\frac{1}{4}$	Medium length, medium plump	Bright, light yellow	12	36
Black Beauty	Black	$\frac{1}{8}$ to $\frac{1}{4}$	$\frac{1}{8}$ to $\frac{1}{4}$	Long, medium plump	Brown to dark brown	12	36
Early Mountain	White	$\frac{1}{8}$ to $\frac{1}{4}$	$\frac{1}{8}$ to $\frac{1}{4}$	Long, medium plump	Bright, white	12	38
Canadian Giant	White	$\frac{1}{8}$ to $\frac{1}{4}$	$\frac{1}{8}$ to $\frac{1}{4}$	Short, medium plump	White	12	40

OATS

Points To Be Observed and Rules for Judging Oats

Trueness to Type or Breed Characteristics—

1. All kernels of the samples should resemble one another in size, shape, color, and hardness. Take 100 kernels, constituting a fair sample of grain. Count out the kernels not true to type. For each kernel off type, cut $\frac{1}{10}$ point.

2. The sample should contain no mixture of wheat, barley, or any other grain. Weigh the whole sample, separate and weigh the foreign grain. Divide the weight of the foreign grain by the weight of the whole sample. This will give the percentage of other grains. For every per cent so found, cut $\frac{1}{2}$ point.

3. Grain should all be white in color for white oats, bright yellow for yellow oats, and a glistening black for black oats. For slight discoloration, cut 1 point and more as discoloration increases. Cut $\frac{1}{10}$ point for each black, red or yellow oat in white oats.

4. Kernels should be of the same size throughout to secure uniformity. Take a fair sample of 100 kernels. For every per cent of grain not conforming to the standard size, cut $\frac{1}{10}$ point.

5. Kernels should be of the same shape throughout the sample, and should conform to the standard of the variety. For every per cent of poorly shaped grain, cut $\frac{1}{10}$ point.

6. The proportion of meat to hull can be judged approximately by carefully handling the grain, and by the weight per bushel. For an accurate determination, weigh out 5 grams of grain, remove the hulls from the kernels, and weigh the hulls. Divide the weight of the hulls by the weight of the whole sample. This will give the percentage of hull to meat. For every per cent the proportion of hull to meat falls below the standard, cut $\frac{1}{4}$ point.

Market Condition—

1. The sample should be free from smutty, musty or bin-burned kernels, as indicated by the odor which shall be sweet. Take an average sample of 100 kernels and count the number of smutty or otherwise damaged kernels. Repeat this 3 times and take the average of the 3 trials. This will give the percentage of poor kernels. Cut sample 1 point for each per cent of smutty, bin-burned and musty kernels. If the sample has a musty odor, cut 10 points.

2. Good oats should weigh 32 or more pounds to the measured bushel. The weight per bushel should be tested with a standard weigher. Cut 1 point for each pound below the standard of the variety.

3. The sample should be free from any kind of dirt or weed seeds. The percentage of foul material is determined by sieves and scales. Remove and weigh the foul material. Divide the weight of the foul material by the weight of the whole sample. This will give the percentage of foul material. Should the foul material consist of noxious seeds, the cut on the sample should be made more severe than if composed of practically harmless material. Cut 1 point for each per cent of foul material.

4. The moisture content can be judged approximately by touch. For an accurate determination, weigh out 10 grams of grain, dry thoroughly in a drying oven. Reweigh and determine the percentage of loss in

weight. This will give the per cent of moisture in the sample. For every per cent of moisture in excess of standard, cut $\frac{1}{2}$ point.

5. Oats should give a germination of not less than 95 per cent. (Make germination test.) Cut $\frac{1}{2}$ point for each per cent the germination falls below 95 per cent.

STUDY OF BARLEY

Varieties of Barley—

There are two well-marked types of barley: the 6-rowed and the 2-rowed barley. In the 6-rowed barley there are 3 spikelets, each bearing a single grain arranged alternately at each joint of the rachis, thus making a spike of six rows of grain. This type includes the hulless as well as most of the cultivated barleys. The grains of the 6-rowed barley are smaller and not so plump as those of the 2-rowed type, but are higher in protein.

In the 2-rowed barley the lateral grains have failed to develop. The flowering glume and palea remain in a somewhat rudimentary form, while the outer glumes are fully developed. In this type the spike is distinctly compressed laterally, while in a 6-rowed type an end view is somewhat star-shaped. This variety is characterized by its large plump grains. In Europe this variety is used almost exclusively for malting, while in this country the 6-rowed barleys are generally used for this purpose.

The type of hulless barley (*H. nudum*) is beardless and is divided into white, purple, and black varieties. There are also beardless varieties among the types which retain the hulls.

LABORATORY STUDY OF THE MATURE BARLEY HEAD

Provide as many types of barley as possible and use the following outline in the study of each variety:

SPIKE OF BARLEY—

1. Number of rows: Two-rowed; six-rowed.....
2. Relation to awns: Awned; partly awned; awnless.....
3. Length: Average of 10 spikes from lower joint of rachis to tip of flowering glume (not counting beard) of upper spikelet.....
4. Shape: Tapering toward tip (when upper spikelets are appressed); tapering both ways (when spikelets are more appressed at both ends than at the middle); uniform.....
 - a. Tip—Acute (terminal spikelets not well filled out); blunt (terminal spikelets well filled out).....
 - b. Base—Abrupt (basal spikelets well filled out); tapering (basal spikelets not well filled out).....
5. Number of joints on the rachis..... Average of 10 spikes.....
6. Number of spikelets at joint of rachis.....
7. Number of grains per spike: Average of 10 spikes.....
8. Weight of middle and lateral grains (if 6-rowed): Average of 10 grains; middle..... lateral.....
9. Color: Whitish; yellowish; yellowish brown; brown; black.....

AWNS OF BARLEY (when present)—

1. Length: Long (5 in. or more); medium (3 to 5 in.); short (less than 3 in.).....
2. Position of awn relative to head: Parallel; spreading.....
3. Relative power of holding spikelet: Deciduous; partly deciduous; persistent.....
4. Color: Whitish; yellowish; brownish; black.....

SPIKELET OF BARLEY—

1. Number of grains per spikelet: (1, 2, 3).....
2. Number of sterile flowers per spikelet.....

3. Size (depending upon shape and size of grain): Broad; medium; narrow.....
4. Outer glume (very narrow and pointed in barley): Awned; awn-pointed; awnless.....

GRAIN OF BARLEY—

1. Hulled or hullless: Enclosed in the flowering glume; free or naked.....
2. Character of endosperm: Hard; medium; soft.....
3. Shape: Long; medium; short; shrunken; medium; plump.....
4. Character of hull (hulled barley): Thick; medium; thin; per cent in 25 grains.....
5. Crease: Deep; medium; full; per cent in 10 grains.....
6. Gluten or starch: Horny; dull; starchy; per cent in 25 grains.....
7. Length of grains, 10 grains.....
8. Width of grains, 10 grains.....
9. Thickness of grains, 10 grains.....
10. Color of grain: Black; purple; purplish brown; yellowish; whitish.
(When black hullless barleys are fully matured they are purplish black in color, but when cut very green they are often yellowish white in color with only a tinge of purple.)
11. Weight of 100 grains..... grams.....
12. Germination: Place 100 grains between well-moistened flannel cloth and keep at a temperature of 80°F. Remove sprouted grains at the end of each 24 hours, for 5 days.

First day,	Fourth day,
Second day,	Fifth day,
Third day,	

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STUDENT'S SCORE-CARD

BARLEY

Name of Scorer..... Date.....
Number of Exhibit..... Name of Variety.....

	Perfect Score	Student's Score	Correct Score
Truthness to Type or Breed Characteristics—			
1. Uniformity.....	10		
2. Freedom from mixture with other grains.....	10		
3. Color of grain.....	5		
4. Size of kernel.....	5		
5. Shape of kernel.....	5		
6. Feeding value: Indicated by hardness, color of interior and proportion of meat to hull.....	10		
Market Condition—			
1. Per cent of damaged, smutty or musty kernels...	10		
2. Weight per bushel.....	10		
3. Per cent of weed seed, dirt and other foreign matter.....	15		
4. Moisture content.....	5		
5. Vitality and maturity.....	15		
Total.....	100		

Commercial grade.....

Designate weed seeds in samples :

STANDARDS OF PERFECTION—BARLEY

Name of variety	Type	Length of grain, inches	Thickness of grain, inches	Shape and plumpness of grain	Color	Moisture content, per cent	Weight per bushel, pounds
Manchuria, six-rowed	White hulled	$\frac{1}{8}$ to $\frac{1}{4}$	$\frac{1}{8}$ to $\frac{1}{4}$	Spindle shaped, with truncate ends and flattened sides, medium plump	Bright white	10	50
Chevalier two-rowed	White hulled	$\frac{1}{8}$ to $\frac{1}{4}$	$\frac{1}{8}$ to $\frac{1}{4}$	Spindle shaped, with truncate ends and slightly flattened sides, plump	Very light bronze	10	52
Success Beardless	Dark hulled	$\frac{1}{8}$ to $\frac{1}{4}$	$\frac{1}{8}$ to $\frac{1}{4}$	Spindle shaped, with truncate ends and flattened sides, medium plump	Light bronze	10	50
White Hulless	White hulless	$\frac{1}{8}$ to $\frac{1}{4}$	$\frac{1}{8}$ to $\frac{1}{4}$	Spindle shaped, very plump	Very light brown	10	64
Black Hulless	Black hulless	$\frac{1}{8}$ to $\frac{1}{4}$	$\frac{1}{8}$ to $\frac{1}{4}$	Spindle shaped, very plump	Purplish black	10	64

BARLEY

Points To Be Observed and Rules for Judging Barley

Trueness of Type or Breed Characteristics—

1. All kernels of the samples should resemble one another in size, shape, color, and hardness. Take 100 kernels, constituting a fair sample of grain. Count out the kernels not true to type. For each kernel off type, cut $\frac{1}{10}$ point.

2. The sample should contain no mixture of wheat, oats, or any other grain. Weigh the whole sample, separate and weigh the foreign grain. Divide the weight of the foreign grain by the weight of the whole sample. This will give the percentage of other grains. For every per cent so found, cut $\frac{1}{2}$ point.

3. Grain should all be light in color. For slight discoloration cut 1 point, and more as discoloration increases.

4. Kernels should be of the same size throughout to secure uniformity. Take a fair sample of 100 kernels. For every per cent of grain not conforming to the standard size, cut $\frac{1}{10}$ point.

5. Kernels should be of the same shape throughout the sample, and should conform to the standard of the variety. For every per cent of poorly shaped grain, cut $\frac{1}{10}$ point.

6. A high feeding value is indicated largely by plumpness and heavy weight per bushel. Cut the kernel in two; notice the color of the interior and the proportion of meat to hull. Cut 10 points for a very light, chaffy grade of kernels, and for smaller deficiencies make smaller cuts according to the judgment of the judge.

Market Condition—

1. The sample should be free from smutty, musty or bin-burned kernels. Take an average sample of 100 kernels and count the number of smutty or otherwise damaged kernels. Repeat this 3 times and take the average of the 3 trials. This will give the percentage of poor kernels. Cut sample 1 point for each per cent of smutty, bin-burned and musty kernels.

2. Good barley should weigh 48 or more pounds to the measured bushel. The weight per bushel should be tested with a standard weigher. Cut 1 point for each pound below the standard of the variety.

3. The sample should be free from any kind of dirt or weed seeds. The percentage of foul material is determined by sieves and scales. Remove and weigh the foul material. Divide the weight of the foul material by the weight of the whole sample. This will give the percentage of foul material. Should the foul material consist of noxious seeds, the cut on the sample should be made more severe than if composed of practically harmless material. Cut 1 point for each per cent of foul material.

4. The moisture content can be judged approximately by touch. For an accurate determination, weigh out 10 grams of grain, dry thoroughly in a drying oven. Reweigh and determine the percentage of loss in weight. This will give the per cent of moisture in the sample. For every per cent of moisture in excess of the standard, cut $\frac{1}{2}$ point.

5. Barley should give a germination of not less than 95 per cent. (Make germination test.) Cut $\frac{1}{2}$ point for each per cent the germination falls below 95 per cent.

Discussion on the Points of the Score-Card for Judging Small Grains

Trueness to Type or Breed Characteristics—

A sample of grain that is true to type should contain kernels which closely resemble one another and whose characteristics distinguish that sample from another of the same class. A great variation is found in type with the different grains. The most important points which determine type in grain are color, size and shape of kernel in wheat; presence or absence of awns and hulls in oats; presence or absence of beards and hulls, and the straightness or crookedness of the kernel furrows in barley.

Wheat may vary in color from white to a dark red, depending upon the variety and the region where grown. The kernel may have a wrinkled surface or be perfectly smooth, or some may be long and pointed and others short and oblong, depending upon the variety. If a mixture of these different types is found in the same sample, it is not true to type.

Oats may be hulled or hullless. They may be white, yellow, red, gray or black, or have different sizes and shapes of kernels, depending upon the variety. The sample should contain no mixture of these different types.

Barley may be hulled or hullless, beardless, white or black, and the kernels may be long and pointed or short and plump. The furrows in the kernels of barley may be straight or crooked, according to whether the barley is six-rowed or two-rowed. In the six-rowed barley two-thirds of the kernels have crooked furrows, while in the two-rowed barley the furrows are all straight. No mixture of the different classes should be found in the sample.

UNIFORMITY—In a uniform sample of grain all of the kernels should be the same size, shape, color and hardness, which should conform to the standard of the variety.

FREEDOM FROM MIXTURE WITH OTHER GRAINS—The sample should contain no grains of any other variety. If a sample of grain contains mixed grains, its value for seed is greatly reduced. The value of wheat for milling and the value of barley for malting purposes is greatly reduced by mixture of other grains, since the best flour and the highest prices are secured with absolutely pure wheat, and maltsters desire only the pure barley in the production of malt. Oats mixed with barley are very objectionable, since they are removed from the barley only with great difficulty.

COLOR OF GRAIN—All kernels in the sample should be uniform in color. No white, amber or macaroni wheat should be mixed with red, or black barley mixed with white. No yellow, red, gray or black oats should be found in a sample of white oats. Any kernels in the sample which do not conform to the standard color, indicate a mixture or a lack of breeding.

SIZE OF KERNEL—All kernels of the sample should be the same size, which should conform to the standard size of the variety. It is also desirable to have the grains as large as possible for the variety, as this is an indication of maturity and strong vitality; thus the kernels should be large and not undersized or shrunken. The grain with large kernels will always bring the highest price on the market. Uniformity in size

is also necessary in order that the grain be sown uniformly, thus giving all plants equal strength and vigor.

SHAPE OF KERNEL—In an ideal sample all of the kernels should have the same shape in order that the grain be sown more uniformly, thus insuring a better stand of grain.

GLUTEN OR STARCH—The gluten or starch in wheat is judged by the hardness and color of the grain, which can be determined by cutting the kernel. The hard, clear, amber-colored kernels contain a high gluten or protein content, and such wheat makes the best grade of flour. In the soft wheat the starch content is indicated by the spongy texture and white color of the interior of the kernel. Soft wheat is preferred for crackers, pastry, etc.

White barley which is used for brewing should be clear, light colored and free from yellow or brown kernels. Barley which is bleached by exposure is disqualified for malting, but is not necessarily injured for feed. Brewers in the United States generally prefer a barley containing a rather high percentage of protein. When corn and rice grits are mixed with barley in the manufacture of beer, a high protein barley is desired, since the corn and rice are both high in starch content and furnish sufficient sugar, so that the barley need have but little starch, but must be high in protein. Corn and rice cheapen the cost of beer production.

PROPORTION OF MEAT TO HULL (Oats and Barley)—The higher the percentage of meat the better will be the feeding value of the grain. This is largely determined by heavy weight per bushel. As the hulls consist largely of crude fibre, the smaller their proportion in the oats and barley the better will be the feeding value of the grain. The average per cent of meat to hull in oats in the United States is 70 per cent; but this may vary greatly, depending upon the season and upon the variety of oats.

PER CENT OF DAMAGED, SMUTTY OR MUSTY KERNELS—Wheat should be free from smutty, musty or broken kernels. Musty kernels introduce a peculiar flavor in the flour which can readily be detected. When the percentage of smutty or musty kernels is large, the wheat is rendered useless for flour making.

Barley should also be free from smutty or musty kernels, as they affect materially the quality of the beer. The barley should also be free from cracked or broken kernels, since these kernels will mold or rot and destroy the flavor of the beer. A good beer depends upon a good quality of malt, and this in turn depends upon a uniform and complete germination of the grain. The feeding value of barley is also affected considerably by the presence of smutty and musty kernels, in that they lessen the palatability and sometimes cause coughing in the animals fed.

Oats should have a sweet odor. The presence of a musty, bin-burned or stack-burned odor is an indication that the oats are not in good keeping condition and that their value for seed and feed is greatly injured. The mustiness in grain is caused by dampness. Oats should also be free from smut.

A process often resorted to by elevator men is that of bleaching the

oats which have been exposed to weather, to whiten them. Sulphur is used for this purpose and often leaves an odor of sulphur with the oats. Oats treated in this way have been greatly injured in feeding value and in germinating power, and should be avoided.

WEIGHT PER BUSHEL—The weight per measured bushel is generally used by grain inspectors and buyers as an indication of quality, and to determine the grade and market value of the grain. Light weight of grain indicates an unsoundness of one or several forms, most commonly immaturity, which is also indicated by a wrinkled, shrunken kernel. Other forms of injury are: Frosted, sprouted, cracked, heated, decayed, chaffy, or weather-beaten grain.

PER CENT OF WEED SEEDS, DIRT, AND OTHER FOREIGN MATERIAL—The grain should be free from all kinds of foul material. If not thoroughly cleaned the sample should at once be scored against, and the cut should be much more severe if the sample of grain contains seeds of noxious weeds, such as wild mustard. The increased price obtained for cleaned grain will usually more than pay for the decreased weight resulting from the cleaning, and the farmer still has the screenings, consisting of cracked and shrunken grain and weed seeds, which, by grinding, can be converted into a good grade of ground feed for stock or may be fed wholly to poultry or sheep. The cleaning can be done on the farm on rainy days or in winter when the value of labor is low, and the farmer should realize the money which can be saved by the use of a good fanning mill.

MOISTURE CONTENT—An average sample of grain contains about 10 per cent of water. When more than this amount of water is present, the grain is liable to become musty. Wheat flour which contains more than the average amount of moisture, may produce bread which will not rise well, and it is considered inferior for this purpose.

VITALITY AND MATURITY—For the highest yields no grain should give a germination of less than 95 per cent. Since the success or failure of the crop depends upon the germination, it should be strong and vigorous, resulting in strong, rapidly growing young plants. The special points, which apply to each grain separately, have been taken up in detail in the previous discussion.

OUTLINE FOR DESCRIBING GRASSES

Name of grass.....

STEM AND LEAVES—

Height..... inches.....

Color of stem.....

Color of leaves.....

Number of leaves.....

HEAD—

Awned or awnless.....

Panicle, compact or spiked.....

Length..... inches.....

Diameter..... inches.....

Color of awn.....

ROOT—

Color of chaff.....

Spreading from root-stock.....

Sod-forming or bunch grass.....

SEEDS—

Length, average in inches.....
 General color.....
 Free or inclosed in scales.....
 Weight per bushel.....pounds
 Amount sown per acre.....pounds
 Germination test.....per cent
 Make sketch of seed from convex side.
 Make sketch of cross-section of seed.

OUTLINE FOR DESCRIBING ALFALFA

Name of variety.....
 Character of plant, excellent, good, poor, inferior.....
 Time of maturity, early, medium, late. Date.....
 Habit of growth: Upright, recumbent, creeping.....

STEM AND LEAVES—

Height..... inches.....
 Character of stem: Fine, medium, woody.....
 Stool: Heavy, medium, thin.....
 Foliage: Thick, medium, scanty.....
 Color of stem.....
 Leaves: Narrow or wide.....
 Leaves: Short or long.....
 Leaves: Smooth or pubescent.....
 Color of leaves.....
 Color of blossom: Purple, indigo, blue, white, yellow, green.....
 Seed pods: Large, medium, small.....
 Seed pods: Black, brown, tan.....
 Yield of seed: Heavy, medium, light.....

NEVADA COLLEGE OF AGRICULTURE

DEPARTMENT OF AGRONOMY

STUDENT'S SCORE-CARD

ALFALFA HAY

Name of Scorer..... Date.....

Number of Exhibit..... Name of Variety.....

	Perfect Score	Student's Score	Correct Score
<i>Scale of Points—</i>			
1. Color: Bright green preferred; brown, in sweated samples, not objected to.....	16		
2. Smell: Fresh, sweet, appetizing; free from mustiness.....	20		
3. Fineness of stem.....	8		
4. Softness of stem: Pliant, not harsh or brittle.....	8		
5. Percentage and condition of leaf.....	14		
6. Purity: Proportion of alfalfa as compared with grasses, etc.....	8		
7. Cleanness: Freedom from dust, molds, objectionable weeds etc.....	18		
8. Weight and general makeup for market.....	8		
Total.....	100		

Commercial grade.....

Designate grasses in sample:.....

NEVADA COLLEGE OF AGRICULTURE
DEPARTMENT OF AGRONOMY

STUDENT'S SCORE-CARD

ALFALFA AND SWEET CLOVER SEED

Name of Scorer..... Date.....

Number of Exhibit..... Name of Variety.....

	Perfect Score	Student's Score	Correct Score
<i>Trueness to Type</i> —			
1. Uniformity.....	5		
2. Freedom from mixture of other clover seed.....	10		
3. Color of seed.....	5		
4. Size of seed.....	5		
<i>Market Condition</i> —			
1. Per cent of damaged or musty seed.....	15		
2. Weight per bushel.....	15		
3. Per cent of weed seed, dirt and other foreign matter.....	20		
4. Vitality and maturity.....	25		
Total.....	100		

Commercial grade.....

Designate weed seeds in samples :.....

**POINTS TO BE OBSERVED AND RULES FOR JUDGING ALFALFA
AND SWEET CLOVER SEED**

Trueness to Type—

1. All seeds of the sample should resemble one another in size and color. Take 100 seeds, constituting a fair sample. Count out the seeds not true to type. For each seed off type, cut $\frac{1}{10}$ point.

2. The sample should contain no mixture of other clover seed. Weigh the whole sample, separate and weigh the foreign seeds. Divide the weight of the foreign seed by the weight of the whole sample. This will give the percentage of other seed. Cut $\frac{1}{2}$ point for each per cent so found.

Alfalfa seeds have a greenish-yellow color with a smooth seed coat, varying from kidney shaped to angular pointed and rounded, and are produced in a spiral pod of 2 or 3 turns, producing from 3 to 6 seeds.

Sweet clover seeds are of a golden yellow and the seed coats covered with minute elevations. The seed is produced in a single pod which has a characteristic pitted surface. The seed is rounder and plumper than alfalfa seed.

3. Brown, badly shriveled seeds, or seeds that have a dull color indicate low vitality. For such discoloration cut according to extent. If only slightly discolored, cut $\frac{1}{4}$ point, and more according to judgment.

4. All seeds should be of good size and appearance. Take a fair sample of 100 seeds. For every per cent of seeds not conforming to the standard size, cut $\frac{1}{10}$ point.

Market Condition—

1. The sample should be free from musty or bin-burned seed. Take an average sample of 100 seeds and count the number of musty or otherwise damaged seeds. This observation is easily made in connection with the germination test. Cut sample 1 point for each per cent of musty or bin-burned seeds.

2. Good alfalfa or sweet clover seed should weigh 60 pounds to the measured bushel. The weight per bushel should be tested with a standard weigher. Cut 1 point for each pound below the standard.

3. The sample should be free from any kind of dirt or weed seeds. The percentage of foul material is determined by sieves and scales. Remove and weigh the foul material. Divide the weight of foul material by the weight of the sample. This will give the percentage of foul material. Should the foul material consist of noxious seeds, such as "dodder," this may be separated from the alfalfa seed with a 20-mesh sieve. A sample of alfalfa seed taken from the bottom of the sack usually contains the greatest number of dodder, due to the relatively small size of the dodder seed. Cut 1½ points for each per cent of foul material. Also cut 1 point for each dodder seed found in a 1-gram sample.

4. Alfalfa and sweet clover seed should give a germination of 90 per cent. (Make germination test.) Count one-half of the hard seeds as germinated. Cut 1 point for each per cent the germination falls below 90 per cent.

"Scarifying" the seed scratches the hard seed coats and results in a better germination. A scarifier is easily made by tacking a large piece of coarse sand paper on a 10x10-inch board, and using a 4x6-inch board covered with sand paper for rubbing the seed. Scarify seed for 15, 30, and 60 seconds and make germination test with each lot of seed. Examine the scarified seed under the microscope.

RULES FOR COMMERCIAL GRADING OF GRAIN

**Rules for Wheat and Corn Adopted by the Bureau of Markets,
U. S. Department of Agriculture**

WHEAT STANDARDS

HARD RED SPRING WHEAT (CLASS I)

This class shall include all varieties of Hard Red Spring wheat, and may include not more than 10 per centum of other wheat or wheats. This class shall be divided into three subclasses as follows:

Subclass (a) Dark Northern Spring

This subclass shall include wheat of the class Hard Red Spring consisting of 75 per centum or more of dark, hard, and vitreous kernels. This subclass shall not include more than 10 per centum of the variety Humpback.

Subclass (b) Northern Spring

This subclass shall include wheat of the class Hard Red Spring consisting of less than 75 per centum and more than 25 per centum of dark, hard, and vitreous kernels. This subclass shall not include more than 10 per centum of wheat of the variety Humpback.

Subclass (c) Red Spring

This subclass shall include wheat of the class Hard Red Spring consisting of not more than 25 per centum of dark, hard, and vitreous kernels. This subclass shall also include wheat of the class Hard Red Spring consisting of more than 10 per centum of the variety Humpback.

Grade requirements for: (a) Dark Northern Spring, (b) Northern Spring, (c) Red Spring

Grade No.	Minimum test weight per bushel	Maximum limits of—						
		Moisture	Damaged kernels		Foreign material other than dockage		Wheats of other classes	
			Total	Heat damage	Total	Matter other than cereal grains	Total	Common White, White Club, and Durum, singly or combined
	Pounds	Per cent	Per ct.	Per cent	Per ct.	Per cent	Per ct.	Per cent
1	58	14.0	2	0.1	1	0.5	5	2
2	57	14.5	4	0.2	2	1.0	10	5
3	55	15.0	7	0.5	3	2.0	10	10
4	53	16.0	10	1.0	5	3.0	10	10
5	50	16.0	15	3.0	7	5.0	10	10
Sample								

Sample Grade shall be wheat of the subclass Dark Northern Spring, or Northern Spring, or Red Spring, respectively, which does not come within the requirements of any of the grades from No. 1 to No. 5, inclusive, or which has any commercially objectionable foreign odor except of smut, garlic, or wild onions, or is very sour, or is heating, hot, infested with live weevils or other insects injurious to stored grain, or is otherwise of distinctly low quality, or contains small, inseparable stones or cinders.

- (1) The wheat in grade No. 1 shall be bright.
- (2) The wheat in grades Nos. 1 to 4, inclusive, shall be cool and sweet.
- (3) The wheat in grade No. 5 shall be cool, but may be musty or slightly sour.
- (4) The wheat in grade No. 1 Dark Northern Spring and grade No. 1 Northern Spring may contain not more than 5 per centum of the hard red spring wheat variety Humpback.

DURUM WHEAT (CLASS II)

This class shall include all varieties of Durum wheat, and may include not more than 10 per centum of other wheat or wheats. This class shall be divided into three subclasses as follows:

Subclass (a) Amber Durum

This subclass shall include wheat of the class Durum consisting of 75 per centum of hard and vitreous kernels of amber color. This subclass shall not include more than 10 per centum of wheat of the variety Red Durum.

Subclass (b) Durum

This subclass shall include wheat of the class Durum consisting of less than 75 per centum of hard and vitreous kernels of amber color. This subclass shall not include more than 10 per centum of wheat of the variety Red Durum.

Subclass (c) Red Durum

This subclass shall include wheat of the class Durum consisting of more than 10 per centum of the variety Red Durum.

Grade requirements for: (a) Amber Durum, (b) Durum, (c) Red Durum

Grade No.	Minimum test weight per bushel	Maximum limits of—						
		Moisture	Damaged kernels		Foreign material other than dockage		Wheats of other classes	
			Total	Heat damage	Total	Matter other than cereal grains	Total	Soft Red Winter, Common White, and White Club, singly or combined
	Pounds	Per cent	Per ct.	Per cent	Per ct.	Per cent	Per ct.	Per cent
1	60	14.0	2	0.1	1	0.5	5	2
2	58	14.5	4	0.2	2	1.0	10	5
3	56	15.0	7	0.5	3	2.0	10	10
4	54	16.0	10	1.0	5	3.0	10	10
5	51	16.0	15	3.0	7	5.0	10	10
Sample								

[Explanatory notes for above table will be found at top of next page.]

¹*Sample Grade* shall be wheat of the subclass Amber Durum, or Durum, or Red Durum, respectively, which does not come within the requirements of any of the grades from No. 1 to No. 5, inclusive, or which has any commercially objectionable foreign odor except of smut, garlic, or wild onions, or is very sour, or is heating, hot, infested with live weevils or other insects injurious to stored grain, or is otherwise of distinctly low quality, or contains small, inseparable stones or cinders.

- (1) The wheat in grade No. 1 shall be bright.
- (2) The wheat in grades Nos. 1 to 4, inclusive, shall be cool and sweet.
- (3) The wheat in grade No. 5 shall be cool, but may be musty or slightly sour.
- (4) The wheat in grade No. 1 Amber Durum and grade No. 1 Durum may contain not more than 5 per centum of wheat of the variety Red Durum.

HARD RED WINTER WHEAT (CLASS III)

This class shall include all varieties of Hard Red Winter wheat, and may include not more than 10 per centum of other wheat or wheats. This class shall be divided into three subclasses as follows:

Subclass (a) Dark Hard Winter

This subclass shall include wheat of the class Hard Red Winter consisting of 80 per centum or more of dark, hard, and vitreous kernels.

Subclass (b) Hard Winter

This subclass shall include wheat of the class Hard Red Winter consisting of less than 80 per centum and more than 25 per centum of dark, hard, and vitreous kernels.

Subclass (c) Yellow Hard Winter

This subclass shall include wheat of the class Hard Red Winter consisting of not more than 25 per centum of dark, hard, and vitreous kernels.

Grade Requirements for: (a) Dark Hard Winter, (b) Hard Winter, (c) Yellow Hard Winter

Grade No.	Minimum test weight per bushel	Maximum limits of—						
		Moisture	Damaged kernels		Foreign material other than dockage		Wheats of other classes	
			Total	Heat damage	Total	Matter other than cereal grains	Total	Common White, and Durum, singly or combined
	<i>Pounds</i>	<i>Per cent</i>	<i>Per ct.</i>	<i>Per cent</i>	<i>Per ct.</i>	<i>Per cent</i>	<i>Per ct.</i>	<i>Per cent</i>
1	60	13.5	2	0.1	1	0.5	5	2
2	58	14.0	4	0.2	2	1.0	10	5
3	56	14.5	7	0.5	3	2.0	10	10
4	54	15.5	10	1.0	5	3.0	10	10
5	51	15.5	15	3.0	7	5.0	10	10
Sample ¹								

¹*Sample Grade* shall be wheat of the subclass Dark Hard Winter, or Hard Winter, or Yellow Hard Winter, respectively, which does not come within the requirements of any of the grades from No. 1 to No. 5, inclusive, or which has any commercially objectionable foreign odor except of smut, garlic, or wild onions, or is very sour, or is heating, hot, infested with live weevils or other insects injurious to stored grain, or is otherwise of distinctly low quality, or contains small, inseparable stones or cinders.

- (1) The wheat in grade No. 1 shall be bright.
- (2) The wheat in grades Nos. 1 to 4, inclusive, shall be cool and sweet.
- (3) The wheat in grade No. 5 shall be cool, but may be musty or slightly sour.

SOFT RED WINTER WHEAT (CLASS IV)

This class shall include all varieties of Soft Red Winter wheat, also Red Club and Red Hybrid wheats of the Pacific Northwest, and may include not more than 10 per centum of other wheat or wheats. This class shall be divided into two subclasses as follows:

Subclass (a) Red Winter

This subclass shall include wheat of the class Soft Red Winter, consisting of both light- and dark-colored kernels. This subclass shall not include more than 10 per centum, either singly or in any combination, of Red Russian, Red Club, Red Hybrids, and other Soft Red Winter wheats possessing the characteristics of those varieties as grown west of the Great Plains area of the United States.

Subclass (b) Red Walla

This subclass shall include wheat of the class Soft Red Winter consisting of 10 per centum, either singly or in any combination, of Red Russian, Red Clubs, Red Hybrids, and other Soft Red Winter wheats possessing the characteristics of those varieties as grown west of the Great Plains area of the United States.

Grade requirements for: (a) Red Winter, (b) Red Walla

Grade No.	Minimum test weight per bushel		Maximum limits of—						
			Moisture	Damaged kernels		Foreign material other than dockage		Wheats of other classes	
	Red Winter	Red Walla		Total	Heat damage	Total	Matter other than cereal grains	Total	Durum
	Pounds	Pounds	Per cent	Per ct.	Per cent	Per ct.	Per cent	Per ct.	Per ct.
1.....	60	58	13.5	2	0.1	1	0.5	5	2
2.....	58	56	14.0	4	0.2	2	1.0	10	3
3.....	56	54	14.5	7	0.5	3	2.0	10	10
4.....	54	52	15.5	10	1.0	5	3.0	10	10
5.....	51	49	15.5	15	3.0	7	5.0	10	10
Sample									

¹Sample Grade shall be wheat of the subclass Red Winter or Red Walla, respectively, which does not come within the requirements of any of the grades from No. 1 to No. 5, inclusive, or which has any commercially objectionable foreign odor except of smut, garlic, or wild onions, or is very sour, or is heating, hot, infested with live weevils or other insects injurious to stored grain, or is otherwise of distinctly low quality, or contains small, inseparable stones or cinders.

- (1) The wheat in grade No. 1 shall be bright.
- (2) The wheat in grades Nos. 1 to 4, inclusive, shall be cool and sweet.
- (3) The wheat in grade No. 5 shall be cool, but may be musty or slightly sour.

COMMON WHITE WHEAT (CLASS V)

This class shall include all varieties, except Sonora, of Common White wheat, whether winter- or spring-grown, and may include not more than 10 per centum of other wheat or wheats. This class shall be divided into two subclasses as follows:

Subclass (a) Hard White

This subclass shall include wheat of the class Common White consisting of 75 per centum or more of hard (not soft and chalky) kernels.

Subclass (b) Soft White

This subclass shall include wheat of the class Common White consisting of less than 75 per centum of hard (not soft and chalky) kernels.

Grade requirements for: (a) Hard White, (b) Soft White

Grade No.	Minimum test weight per bushel	Maximum limits of—						
		Moisture	Damaged kernels		Foreign material other than dockage		Wheats of other classes	
			Total	Heat damage	Total	Matter other than cereal grains	Total	Durum
	<i>Pounds</i>	<i>Per cent</i>	<i>Per ct.</i>	<i>Per cent</i>	<i>Per ct.</i>	<i>Per cent</i>	<i>Per ct.</i>	<i>Per cent</i>
1.....	60	13.5	2	0.1	1	0.5	5	2
2.....	58	14.0	4	0.2	2	1.0	10	3
3.....	56	14.5	7	0.5	3	2.0	10	10
4.....	54	15.5	10	1.0	5	3.0	10	10
5.....	51	15.5	15	3.0	7	5.0	10	10
Sample								

¹Sample Grade shall be wheat of the subclass Hard White or Soft White, respectively, which does not come within the requirements of any of the grades from No. 1 to No. 5, inclusive, or which has any commercially objectionable foreign odor except of smut, garlic, or wild onions, or is very sour, or is heating, hot, infested with live weevils or other insects injurious to stored grain, or is otherwise of distinctly low quality, or contains small, inseparable stones or cinders.

- (1) The wheat in grade No. 1 shall be bright.
- (2) The wheat in grades Nos. 1 to 4, inclusive, shall be cool and sweet.
- (3) The wheat in grade No. 5 shall be cool, but may be musty or slightly sour.

WHITE CLUB WHEAT (CLASS VI)

This class shall include all varieties and hybrids of White Club wheat, and the Common White wheat known as Sonora, and may include not more than 10 per centum of other wheat or wheats.

Grade requirements for White Club Wheat

Grade No.	Minimum test weight per bushel	Maximum limits of—						
		Moisture	Damaged kernels		Foreign material other than dockage		Wheat of other classes	
			Total	Heat damage	Total	Matter other than cereal grains	Total	Durum
	<i>Pounds</i>	<i>Per cent</i>	<i>Per ct.</i>	<i>Per cent</i>	<i>Per ct.</i>	<i>Per cent</i>	<i>Per ct.</i>	<i>Per cent</i>
1	60	13.5	2	0.1	1	0.5	5	2
2	58	14.0	4	0.2	2	1.0	10	3
3	56	14.5	7	0.5	3	2.0	10	10
4	54	15.5	10	1.0	5	3.0	10	10
5	51	15.5	15	3.0	7	5.0	10	10
Sample ¹								

¹*Sample Grade* shall be wheat of the class White Club which does not come within the requirements of any of the grades from No. 1 to No. 5, inclusive, or which has any commercially objectionable foreign odor except of smut, garlic, or wild onions, or is very sour, or is heating, hot, infested with live weevils or other insects injurious to stored grain, or is otherwise of distinctly low quality, or contains small, inseparable stones or cinders.

(1) The wheat in grade No. 1 shall be bright.

(2) The wheat in grades Nos. 1 to 4, inclusive, shall be cool and sweet.

(3) The wheat in grade No. 5 shall be cool, but may be musty or slightly sour.

SHELLED CORN STANDARDS

CLASSES OF SHELLED CORN

Shelled corn shall be divided into three classes, as follows:

White Corn

This class shall consist of corn of which at least 98 per centum by weight of the kernels are white. A slight tinge of light straw color or of pink on kernels of corn otherwise white shall not affect their classification as white corn.

Yellow Corn

This class shall consist of corn of which at least 95 per centum by weight of the kernels are yellow. A slight tinge of red on kernels of corn otherwise yellow shall not affect their classification as yellow corn.

Mixed Corn

This class shall consist of corn of various colors not coming within the limits for color as provided in the definitions of white corn and yellow corn. White-capped yellow kernels shall be classified as mixed corn.

Grade requirements for White, Yellow and Mixed Corn

Grade No.	Minimum test weight per bushel	Maximum limits of—				
		Moisture	Foreign material and cracked corn	Damaged corn		
				Total	Heat damage	
	<i>Pounds</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	
1	55	14.0	2	2	0.0	
2	53	15.5	3	4	0.1	
3	51	17.5	4	6	0.3	
4	49	19.5	5	8	0.5	
5	47	21.5	6	10	1.0	
6	44	23.0	7	15	3.0	
Sample ¹						

¹*Sample Grade* shall be White corn, or Yellow corn, or Mixed corn, respectively, which does not come within the requirements of any of the grades from No. 1 to No. 6, inclusive, or which has any commercially objectionable foreign odor, or is heating, hot, infested with live weevils or other insects injurious to stored grain, or is otherwise of distinctly low quality.

(1) The corn in grades Nos. 1 to 5, inclusive, shall be cool and sweet.

(2) The corn in grade No. 6 shall be cool, but may be musty or sour.

**Rules for Oats, Barley and Rye Adopted by the Minneapolis and Duluth
Grain Inspection Boards, September 2, 1908**

OATS

No. 1 White Oats—Shall be white, dry, sweet, sound, clean, and free from other grain, and shall weigh not less than 32 pounds to the measured bushel.

No. 2 White Oats—Shall be seven-eighths white, dry, sweet, sound, reasonably clean, and practically free from other grain, and shall weigh not less than 31 pounds to the measured bushel.

No. 3 White Oats—Shall be seven-eighths white, dry, sweet, sound, reasonably clean, and practically free from other grain, and shall weigh not less than 28 pounds to the measured bushel.

No. 4 White Oats—Shall include all oats not sufficiently sound and clean for No. 3 White oats and shall weigh not less than 24 pounds to the measured bushel.

Yellow Oats—The grades of Nos. 1, 2, and 3 Yellow oats shall correspond with the grades of Nos. 1, 2, and 3 White oats, excepting that they shall be of the yellow varieties.

No. 1 Oats—Shall be dry, sweet, sound, clean and free from other grains, and shall weigh not less than 32 pounds to the measured bushel.

No. 2 Oats—Shall be dry, sweet, sound, reasonably clean and practically free from other grains, and shall weigh not less than 31 pounds to the measured bushel.

No. 3 Oats—Shall be all oats that are merchantable and warehouseable and not fit for higher grades.

No. 1 Clipped White Oats—Shall be white, dry, sweet, sound, clean and free from other grains and shall weigh not less than 40 pounds to the measured bushel.

No. 2 Clipped White Oats—Shall be seven-eighths white, dry, sweet, sound, reasonably clean, and practically free from other grains, and shall weigh not less than 38 pounds to the measured bushel.

No. 3 Clipped White Oats—Shall be seven-eighths white, dry, sweet, sound, reasonably clean and practically free from other grains, and shall weigh not less than 36 pounds to the measured bushel.

BARLEY

No. 1 Barley—Shall be plump, bright, clean, and free from other grains, and shall weigh not less than 48 pounds to the measured bushel.

No. 2 Barley—Shall be sound and of healthy color, not plump enough for No. 1, reasonably clean and reasonably free from other grains, and shall weigh not less than 56 pounds to the measured bushel.

No. 3 Barley—Shall include all slightly shrunken and otherwise slightly damaged barley, not good enough for No. 2, and shall weigh not less than 44 pounds to the measured bushel.

No. 4 Barley—Shall include all barley fit for malting purposes, not good enough for No. 3.

No. 1 Feed Barley—Must test not less than 40 pounds to the measured bushel and be reasonably sound and reasonably clean.

No. 2 Feed Barley—Shall include all barley which is for any cause unfit for the grade of No. 1 Feed Barley.

Chevalier Barley—Nos. 1, 2, and 3 Chevalier barley shall conform in all respects to the grades of Nos. 1, 2, and 3 barley, except that they shall be of a Chevalier variety, grown in Montana, Oregon and on the Pacific Coast.

RYE

No. 1 Rye—Shall be sound, plump and well cleaned, and shall weigh not less than 56 pounds to the measured bushel.

No. 2 Rye—Shall be sound, reasonably clean, and reasonably free from other grains, and shall weigh not less than 54 pounds to the measured bushel.

No. 3 Rye—All rye slightly damaged, slightly musty, or from any other cause unfit for No. 2, shall be graded as No. 3.

No Grade—All wheat, oats, barley, rye and corn that are in a heating condition, too musty or too damp to be safe for warehousing, or that is badly blighted, badly damaged, exceedingly dirty, or otherwise unfit for store, shall be classed as no grade with inspector's notation as to quality and condition.

COMMERCIAL GRADING OF HAY AND STRAW

Rules Adopted by the National Hay Association

TIMOTHY HAY

Choice Timothy Hay—Shall be timothy not mixed with over one-twentieth other grasses, properly cured, bright, natural color, sound and well baled.

No. 1 Timothy Hay—Shall be timothy with not more than one-eighth mixed with clover or other tame grasses, properly cured, good color, sound and well baled.

No. 2 Timothy Hay—Shall be timothy not good enough for No. 1, not over one-fourth mixed with clover or other tame grasses, fair color, sound and well baled.

No. 3 Timothy Hay—Shall include all hay not good enough for the other grades, sound and well baled.

CLOVER MIXED HAY

Light Clover Mixed Hay—Shall be timothy and clover mixed, the clover mixture not over one-fourth, properly cured, sound, good color, and well baled.

No. 1 Mixed Clover Hay—Shall be timothy and clover mixed, with at least one-half timothy, good color, sound and well-baled.

No. 2 Mixed Clover Hay—Shall be timothy and clover mixed, with at least one-third timothy, reasonably sound and well baled.

CLOVER HAY

No. 1 Clover Hay—Shall be medium clover not over one-twentieth other grasses, properly cured, sound and well baled.

No. 2 Clover Hay—Shall be clover, sound, well baled, not good enough for No. 1.

No Grade Hay—Shall include all hay badly cured, stained, threshed or in any way unsound.

PRAIRIE HAY

Choice Prairie Hay—Shall be upland hay of bright, natural color, well cured, sweet, sound, and may contain 3 per cent weeds.

No. 1 Prairie Hay—Shall be upland and may contain one-quarter midland, both of good color, well cured, sweet, sound, and may contain 8 per cent weeds.

No. 2 Prairie Hay—Shall be upland of fair color and may contain one-half midland, both of good color, well cured, sweet, sound, and may contain 12½ per cent weeds.

No. 3 Prairie Hay—Shall include hay not good enough for other grades and not caked.

No. 1 Midland—Shall be midland hay of good color, well cured, sweet, sound, and may contain 3 per cent weeds.

No. 2 Midland—Shall be fair color or slough hay of good color, and may contain 12½ per cent weeds.

Packing Hay—Shall include all wild hay not good enough for other grades and not caked.

No Grade Prairie Hay—Shall include all hay not good enough for other grades.

ALFALFA

Choice Alfalfa—Shall be reasonably fine, leafy alfalfa of bright-green color properly cured, sound, sweet, and well baled.

No. 1 Alfalfa—Shall be coarse alfalfa of natural color, or reasonably fine, leafy alfalfa of good color, and may contain 5 per cent of foreign grasses, must be well baled, sound, and sweet.

No. 2 Alfalfa—Shall include alfalfa, somewhat bleached, but of fair color, reasonably leafy, not more than one-eighth foreign grasses, sound and well baled.

No. 3 Alfalfa—Shall include bleached alfalfa, or alfalfa mixed with not to exceed one-fourth foreign grasses, but when mixed must be of fair color, sound and well baled.

No Grade Alfalfa—Shall include all alfalfa not good enough for other grades, caked, musty, greasy or threshed.

RYE STRAW

No. 1 Straight Rye Straw—Shall be in large bales, clean, bright, long rye straw, pressed in bundles, sound, and well baled.

No. 2 Straight Rye Straw—Shall be in large bales, long rye straw, pressed in bundles, sound and well baled, not good enough for No. 1.

No. 1 Tangled Rye Straw—Shall be reasonably clean rye straw, good color, sound and well baled.

No. 2 Tangled Rye Straw—Shall be reasonably clean, may be some stained, but not good enough for No. 1.

WHEAT STRAW

No. 1 Wheat Straw—Shall be reasonably clean wheat straw, sound and well baled.

No. 2 Wheat Straw—Shall be reasonably clean, may be some stained, but not good enough for No. 1.

OAT STRAW

No. 1 Oat Straw—Shall be reasonably clean oat straw, sound and well baled.

No. 2 Oat Straw—Shall be reasonably clean, may be some stained, but not good enough for No. 1.

EXAMINING HAY OR STRAW

With a sharp hay knife cut the bale or pile of straw in two. Then cut off a section about five inches thick. Carefully save the section removed, and separate into its various parts, as Timothy, Clover, weeds, etc. Determine the amount of each by weight.



CARSON CITY, NEVADA

STATE PRINTING OFFICE, : JOE FARNSWORTH, SUPERINTENDENT

1919

PUBLIC SERVICE COMMISSION OF NEVADA

RULES AND REGULATIONS RELATING TO THE FILING OF BONDS, TARIFFS AND REPORTS OF AUTOMOBILE COMMON CARRIERS OPERATING IN THE STATE OF NEVADA; AND RULES AND REGULATIONS APPER- TAINING TO THE FILING OF APPLICATIONS FOR CERTIFICATES OF PUBLIC CONVENIENCE

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DEFINING THE TERM "PUBLIC UTILITY"

SEC. 7. The term "Public Utility," as used herein, shall mean and embrace all corporations, companies, individuals, associations of individuals, their lessees, trustees or receivers (appointed by any court whatsoever) that now or may hereafter own, operate, manage, or control any railroad or part of a railroad as a common carrier in this state, or cars or other equipment used thereon, or bridges, terminals, or sidetracks, or any docks or wharves or storage elevators used in connection therewith, whether owned by such railroads or otherwise; also any company or individual or association of individuals owning or operating automobiles, auto trucks, or other self-propelled vehicles, engaged in transporting persons or property for hire over and along the highways of this state as common carriers; also express companies, telegraph and telephone companies, and all companies which may own cars of any kind or character, used and operated as a part of railroad trains in or through this state, and all duties required of and penalties imposed upon any railroad or any officer or agent thereof shall, in so far as the same are applicable, be required of and imposed upon the owner or operator of said automobiles, auto trucks, or other self-propelled vehicles, transporting persons or property for hire over and along the highways of this state as common carriers, express companies, telegraph and telephone companies, and companies which may own cars of any kind or character, used and operated as a part of railroad trains in or through this state, and their officers and agents, and the commission shall have the power of supervision and control of all such companies and individuals to the same extent as of railroads; *provided, however*, that automobiles used exclusively as hearses or ambulances operated within the limits of cities and towns, and other automobiles which have no specified routes of travel, and which are not operated as common carriers, shall not be construed as being under the jurisdiction of the commission within the meaning thereof. "Public Utility" shall also embrace every corporation, company, individual, association of individuals, their lessees, trustees or receivers appointed by any court whatsoever, that now or hereafter may own, operate or control any plant or equipment, or any part of a plant or equipment within the state for the production, delivery or furnishing for or to other persons, firms, associations, or corporations, private or municipal, heat, light, power in any form or by any agency, water for business, manufacturing, agricultural or household use, or sewerage service whether within the limits of municipalities towns, or villages, or elsewhere; and the public service commission is hereby invested with full power of supervision, regulation and control of all such utilities, subject to the provisions of this act and to the exclusion of the jurisdiction, regulation and control of such utilities by any municipality, town or village, unless otherwise provided by law.

(a) The provisions of this act and the term "Public Utility" shall apply to the transportation of passengers and property and the transmission of messages between points within the state, and to the receiving, switching, delivering, storing, and hauling of such property, and receiving and delivering messages, and to all charges connected there-

with, including icing charges and mileage charges, and shall apply to all railroads, corporations, automobiles, auto trucks, or other self-propelled vehicles, express companies, car companies, freight and freight-line companies, and to all associations of persons, whether incorporated or otherwise, that shall do any business as common carriers upon or over any line of railroad or any public highway within this state, and to any common carrier engaged in the transportation of passengers and property, wholly by rail, or partly by rail and partly by water.

RELATING TO FILING OF BONDS BY AUTOMOBILE COMMON CARRIERS

SEC. 18. The commission shall have power, in the interest of safety or service, after hearing, to determine and order required and necessary repairs, reinforcements or reconstruction of property, lines, equipment, appliances, buildings, tracks and all property used or useful in the service; to order the use of safety appliances in the interest of employees and the public, and to make and enforce any rule or regulation necessarily incident thereto; the commission shall have the power to require each automobile common carrier, subject to the provisions hereof, to file and keep in force with the commission an indemnity bond approved by the commission in an amount not less than five hundred (\$500) dollars nor more than ten thousand (\$10,000) dollars for the purpose of reimbursing passengers or shippers for loss or damage or personal injuries caused by the neglect of any automobile common carrier, its owner, operator, agent or employee.

The commission shall have the power to regulate the manner in which the tracks of any street, steam, or electric railroad or other common carrier crosses the tracks of any other railway or common carrier, and prescribe such regulations and safety devices as may be necessary for the protection of the public and the prevention of accidents.

RELATING TO CERTIFICATES OF PUBLIC CONVENIENCE

Sec. 364. Every public utility owning, controlling, operating or maintaining or having any contemplation of owning, controlling, or operating any public utility shall before beginning such operation or continuing of operations, or construction of any line, plant or system or any extension of a line, plant or system within this state, obtain from the public service commission a certificate that the present or future public convenience or necessity requires or will require such continued operation or commencement of operations or construction; *provided*, that nothing herein shall be construed as requiring a public utility to secure such certificate for any extension within any town or city within which it shall theretofore have lawfully commenced operations or for an extension into territory either within or without the city or town contiguous to its railroad, line, plant or system and not then served by a public utility of like character. Upon the granting of any certificate of public convenience, the commission may make such order and prescribe such terms and conditions for the location of lines, plants, or systems to be constructed, extended or affected as may be just and reasonable.

Every applicant for a certificate of public convenience shall furnish such evidence of its corporate character and of its franchise or permits as may be required by the commission. The commission shall have the power, after hearing, to issue or refuse such certificate of public convenience or to issue it for the construction of a portion only of the contemplated line, plant or system or extension thereof, and may attach thereto such terms and conditions as, in its judgment, the public convenience and necessity may require.

No public utility beginning, prosecuting or completing any new construction in violation of this act shall be permitted to levy any tolls or charges for services rendered, and all such tolls and charges shall be void.

It shall be unlawful for any public utility to discontinue, modify or restrict service to any city, town, municipality, community or territory therefore served by it, except upon twenty (20) days' notice filed with the commission, specifying in detail the character and nature of the discontinuance, or restriction of the service intended, and upon order of the commission, made after hearing, permitting such discontinuance, modification or restriction of service.

All hearings and investigations under this section shall be conducted substantially as is provided for hearings and investigations of tolls, charges, and service. Every order refusing or granting any certificates of public convenience, or granting or refusing permission to discontinue, modify or restrict service, as provided in this section, shall be *prima facie* lawful from the date of the order until changed or modified by the order of the commission or in pursuance of section 33 of this act; *provided, however*, that a municipality constructing, leasing, operating or maintaining any public utility shall not be required to obtain a certificate of convenience.

RAILROAD COMMISSION OF NEVADA

CARSON CITY, NEVADA, May 14, 1917.

To Automobile Freight and Passenger Carriers:

In compliance with Sections 2 and 7 of the Railroad Commission law of Nevada, as amended by the Twenty-eighth Session of the Legislature and approved March 27, 1917, the Commission has entered a general order requiring all owners of automobile freight and passenger carriers which are subject to the Railroad Commission's jurisdiction to file on or before June 15, 1917, tariffs showing their rates, fares, charges, classifications, time schedules, routes, rules and regulations.

The additional classes of carriers subject to the Railroad Commission's jurisdiction under the Railroad Commission law as amended are all automobiles, auto trucks, or other self-propelled vehicles engaged in transporting persons or property for hire over and along the highways of this State as common carriers; *provided, however*, that automobiles used exclusively as hearses or ambulances operated within the limits of cities and towns, and other automobiles which have no specified routes of travel and which are not operated as common carriers, are not construed as being under the Commission's jurisdiction.

It is unlawful for carriers subject to the jurisdiction of the Railroad Commission to collect any charge or rate not named in tariffs on file with the Railroad Commission.

In addition to the foregoing, amended Section 7 of the Railroad Commission law makes it the duty of the Commission to require each automobile common carrier, subject to the provisions of the Act, to file and keep in force with the Commission an indemnity bond, issued by a company authorized to do business in the State of Nevada, in an amount not less than \$500 nor more than \$10,000, and in such form as the Commission may prescribe.

In order to have data for the purpose of arriving at proper figures on which to base the amount of the indemnity bond, the Commission is enclosing herewith a blank form to be filled out and filed with the Commission by each automobile common carrier at the earliest date possible, but not later than June 15, 1917.

Following will be found the Commission's Tariff Ruling No. 6, which must be complied with by all owners or operators of automobiles as common carriers in this State in filing their tariffs, fares, charges, classifications, time schedules, routes, rules and regulations.

BY ORDER OF THE RAILROAD COMMISSION OF NEVADA,

E. H. WALKER, *Secretary*.

TARIFF RULING No. 6

PASSENGER FARE SCHEDULES

Section 1. *Title-Page of Every Tariff Must Show:*

1. N. R. C. number in upper left-hand corner, followed by N. R. C. numbers that are canceled thereby. (Note: A separate series of N. R. C numbers for freight and passenger tariffs must be used.)
2. Name of issuing carrier.
3. Whether tariff is local, or joint, or both. (Names of participating carriers, if joint tariff.)
4. The territory or points from and to which the tariff applies, briefly stated, together with the route traversed.
5. Date of issue. Date effective.
6. Name, title and address of official by whom tariff is issued.
7. If tariffs are issued on less than the statutory notice of thirty days by permission, or order, or authorization of the Railroad Commission, notation "Issued under special permission of the Railroad Commission of Nevada No.....of (date), " or "Issued in compliance with order or authorization of the Railroad Commission of Nevada in Case or Application No.....," must appear on title-page.
8. Temporary excursion tariffs must show date of expiration, viz: "Expires.....unless sooner canceled, changed or extended," such date of expiration to be the last date on which return portion of tickets sold under the tariff is good for passage.

Section 2. *Passenger Tariffs Must Contain:*

1. The fares explicitly stated in cents or in dollars and cents, together with the names of the places from and to which they apply, arranged in a systematic manner.
2. If desired, carriers may use a distance table for basis of fares by incorporating in their tariffs an official list of all points in connection with which such basis is to apply and showing in proper order the distance between each point.
3. Full explanation of reference marks and technical abbreviations used in the tariff.
4. Rules and regulations which govern the tariff, in clear and explicit terms, setting forth all privileges, stopovers, extension of time limit, refunds for unused and partly used tickets, baggage rules, excess baggage rates, etc.
5. All passenger tariffs must show location of stopping point in each terminal municipality.

FREIGHT RATE SCHEDULES

Section 3. *Title-Page of Every Tariff Must Show:*

1. N. R. C. number in upper left-hand corner, followed by N. R. C. numbers that are canceled thereby. (Note: A separate series of N. R. C. numbers for freight and passenger tariffs must be used.)
2. Name of issuing carrier.
3. Whether tariff is local, or joint, or both. (Names of participating carriers, if joint tariff.)
4. The territory or points from and to which the tariff applies, briefly stated.
5. Date of issue. Date effective.
6. Name, title and address of official by whom tariff is issued.
7. If tariffs are issued on less than the statutory notice of thirty days by permission, or order, or authorization of the Railroad Commission, notation "Issued under special permission of the Railroad Commission of Nevada No..... of (date).....," or "Issued in compliance with order or authorization of the Railroad Commission of Nevada in Case or Application No.....," must appear on title-page.

Section 4. *Freight Tariffs Must Contain:*

1. Alphabetically arranged and complete index of all commodities upon which commodity rates are named. If all of the commodity rates to each destination in the tariff are arranged alphabetically by commodities, further index of the same may be omitted.
2. Alphabetically arranged and complete index of points FROM which tariff applies, and alphabetically arranged and complete index of points TO which tariff applies.
3. All rates must be explicitly stated in cents, or dollars and cents, per one hundred pounds or per ton of 2,000 pounds, together with the names of the places from and to which they apply, arranged in a simple and systematic manner.
4. If desired, carriers may use a distance table for basis of rates by incorporating in their tariffs an official list of all points in connection with which such basis is to apply, and showing in geographical order the distance between such points.
5. Full explanation of reference marks and technical abbreviations used in the tariff.
6. Rules and regulations which govern the tariff, in clear and explicit terms, setting forth all privileges and services covered by the rates, such as free storage and store-door receipt and delivery.

Section 5. *Time Schedules:*

1. All common carriers must file a full and complete time schedule showing time of arrival and departure at all points.

Section 6. *General Instructions Relating to Passenger and Freight Tariffs:*

1. Full 30 days' statutory notice is required on all tariffs, except where special permission has been obtained, or on temporary excursion tariffs.
2. Temporary excursion tariffs may be established upon one day's notice to the public and mailing two (2) copies to the Railroad Commission.
3. Tariffs of lines now in operation may be issued and filed in the first instance on one day's notice.
4. Tariffs must be typewritten or issued by any of the various printing processes, provided all copies so issued are clear and legible.
5. Two (2) copies of all tariffs and classifications and three (3) copies of all time schedules and circulars must be filed with the Railroad Commission. Address, "Railroad Commission of Nevada, Carson City, Nevada."

BY ORDER OF THE RAILROAD COMMISSION OF NEVADA,

E. H. WALKER, *Secretary.*

RAILROAD COMMISSION OF NEVADA

CARSON CITY, NEVADA, July 19, 1918.

To All Automobile Common Carriers Operating in the State of Nevada:

In accordance with Sections 2 and 7 of the Railroad Commission Law of this State, as amended March 27, 1917, it is the duty of this Commission to require the filing of bonds by all automobile common carriers operating in the State. We are therefore enclosing herewith a form of bond, together with a report form covering the operations of automobile common carriers for the year ending December 31, 1917.

The amount of bond which you will be required to file will be determined according to the amount of your gross earnings for the year 1917, or for the period during which you have operated. The following scale indicates the amount of bond required of automobile common carriers whose gross earnings equal certain amounts:

SCALE

<i>Automobile common carriers with gross earnings of—</i>	<i>Amount of Bond</i>
\$2,000 per annum or less.....	\$2,500
2,001 to \$3,000.....	3,000
3,001 to 4,000.....	3,500
4,001 to 5,000.....	4,000
5,001 to 6,000.....	4,500
6,001 to 7,500.....	5,000
7,501 to 10,000.....	6,000
10,001 to 15,000.....	7,000
15,001 to 20,000.....	8,000
20,001 to 25,000.....	9,000
25,001 or over.....	10,000

If you have been operating as an automobile common carrier for a period of less than one year, it will be necessary for you to determine your gross earnings by taking the actual gross earnings accruing during the period of operation, and upon that basis to estimate the gross earnings for the entire year period. For example: If your company had been operating for only three months (one-quarter of a year) during the year 1917 or 1918 and the gross earnings had amounted to \$1,000, your estimated gross earnings for the year period would be \$4,000.

At the time you file your bond, you must also file the sworn statement setting forth your earnings and expenses and other data as required by the form enclosed herewith. No bond will be accepted by the Commission unless a sworn statement of gross earnings is filed.

The Commission hereby gives you until August 15, 1918, in which to file your bond and the statement of your annual receipts and expenses, etc.

RAILROAD COMMISSION OF NEVADA,

By E. H. WALKER, *Secretary.*

GENERAL RULING No. 3

To All Automobile Freight and Passenger Carriers:

Under an order of this Commission dated May 14, 1917, all automobile common carriers were notified to file their freight and passenger tariff schedules on or before June 15, 1917.

In compliance with this order a number of companies, corporations, associations and individuals duly filed freight and passenger schedules. Numerous other operators of automobiles failed to file their schedules either through neglect or because they considered that under the terms of section 2 of the Railroad Commission Law as amended in 1917, they were not operating as common carriers.

Section 2 of the Railroad Commission Law of Nevada reads, in part, as follows:

The term "railroad," whenever used herein, shall mean and embrace any company or individuals or association of individuals owning or operating automobiles, auto-trucks, or other self-propelled vehicles, engaged in transporting persons or property for hire over and along the highways of this state as common carriers; and all duties required of and penalties imposed upon any railroad or any other officer or agent thereof shall, in so far as the same are applicable, be required of and imposed upon the owner or operator of said automobiles, auto-trucks, or other self-propelled vehicles, transporting persons or property for hire over and along the highways of this state as common carriers; * * * *provided, however*, that automobiles used exclusively as hearses or ambulances operated within the limits of cities and towns, and other automobiles which have no specified routes of travel and which are not operated as common carriers, shall not be construed as being under the jurisdiction of the commission within the meaning hereof.

On May 29, 1917, the Commission issued its General Ruling No. 2, setting forth a resolution passed at a regular meeting held the same date. This resolution reads as follows:

Resolved, That all companies or persons operating automobiles between two or more given points, making one or more trips a week between such points, and who solicit passenger, freight or express business while engaged in that service, shall be considered in regular service and subject to the jurisdiction of the Railroad Commission of Nevada as automobile common carriers.

Resolved further, That all companies or persons operating automobiles as common carriers shall be required to enter into and file a bond with the Commission and shall also be required to file passenger and freight schedules and any other schedules covering the transportation of persons or property which may be required by the Commission, together with such reports as the Commission may demand from time to time.

After giving this matter further consideration, the Commission at a regular meeting held December 14, 1918, withdrew its resolution of May 29, 1917, and ordered the cancelation of General Ruling No. 2, and the following resolution and orders were adopted in lieu thereof:

Resolved, That all companies, individuals or associations of individuals owning or operating automobiles, auto-trucks, or other self-propelled vehicles, engaged in the transportation of persons or property for hire along the highways of this State as common carriers, shall be required to file bonds with the Commission, with good and sufficient sureties, together with tariff schedules, rules and regulations governing the transportation of persons and property.

Resolved further, That the filing of bonds and schedules of rates, rules and regulations, governing the transportation of persons and property shall be required of all companies, individuals or associations of individuals holding themselves out for hire as common carriers whether operating on regular schedule between specified points, or holding themselves, employees or equipment out for hire upon call to transport persons or property between various points in the State of Nevada.

Resolved further, That this ruling shall not apply to companies, individuals, or associations of individuals operating hearses, ambulances, taxicabs, automobiles or auto-trucks which are not operated as common carriers within the limits of cities or towns in the State of Nevada.

IT IS THEREFORE ORDERED, That all companies, individuals or associations of individuals operating automobiles or auto-trucks as common carriers as defined above, shall be required to file their schedules of freight and passenger rates and rules and regulations governing the transportation of persons or property, in the form prescribed by this Commission under its Tariff Ruling No. 6, on or before January 15, 1919.

IT IS FURTHER ORDERED, That no such companies, individuals or associations of individuals shall thereafter be permitted to engage in business as common carriers until they have first filed their tariff charges and specified the routes over which they will operate, and have secured notice from the Commission that these regulations have been satisfactorily complied with.

IT IS FURTHER ORDERED, That all companies, individuals or associations of individuals failing to comply with this order shall be considered as violators of the Railroad Commission Law of Nevada, and each case will be referred to the Attorney-General of Nevada for proper action; *provided*, that persons who have already filed tariff schedules, rules and regulations and bonds in compliance with past orders of the Commission may be considered as having complied with this order.

IT IS FURTHER ORDERED, That as soon after the receipt of tariff schedules as possible, all companies, individuals and associations of individuals who have not already filed bonds, shall be notified as to the amount in which bonds shall be filed and shall be given a reasonable time in which to file the same with the Commission.

IT IS FURTHER ORDERED, That all companies, individuals, or associations of individuals operating automobile lines as common carriers in the State of Nevada, will be required to submit bonds for the approval of the District Attorney of the county in which such bonds are executed before filing same with the Commission.

RAILROAD COMMISSION OF NEVADA,

By E. H. WALKER, *Secretary*.

Dated December 14, 1918.

PUBLIC SERVICE COMMISSION OF NEVADA

CARSON CITY, NEVADA, June 18, 1919.

To All Automobile Common Carriers in Nevada:

Enclosed herewith you will find a copy of this Commission's General Ruling No. 4 and copies of a form to be filled out by you and filed with this Commission, showing details regarding your earnings and expenses for the calendar year 1918, or for the period during which you have been in business.

It is important that you should study the provisions of General Ruling No. 4. You will note that, if you are operating or intend to operate in competition with railroads or other automobile common carriers serving the same communities which you are serving or intend to serve, it is necessary under the provisions of the Public Service Commission law of this State for you to file an application with the Commission for a certificate of public convenience or necessity, authorizing you to continue such service or to commence operations.

You will further note that if you are already operating in competitive territory you may continue to do so until otherwise ordered by the Commission, but that it is necessary for you to file the application in compliance with the law. However, if you contemplate operating in a territory already served by a railroad or other automobile common carriers, you cannot establish rates or commence operations until authorized to do so by this Commission.

In rendering your report to the Commission you will file the white copy (the original) and keep the yellow copy for your own information. The Commission requires that you render this report for the calendar year 1918 unless you did not operate in that year. If such is the case, you will render a report of your earnings and expenses for the period during which you have operated in 1919, up to and including May 31, 1919. If you only operated for a portion of the year 1918, you will render a report of your earnings and expenses for the period during which you did operate in that year. In all cases where you report for a period less than the calendar year 1918, you will designate on the face of the report the period which is covered.

Before filing this report the same must be sworn to before a Notary Public or some officer authorized to administer an oath. On the basis of your report the amount of the bond which you will be required to file, under the provisions of the Public Service Commission law of this State, will be fixed.

This report must be filed with the Commission on or before the 15th day of July, 1919.

Very truly yours,

PUBLIC SERVICE COMMISSION OF NEVADA,

By E. H. WALKER, *Secretary.*

GENERAL RULING No. 4

To District Attorneys, Public Utilities, and All Parties Concerned:

This Commission has received a communication from the Attorney-General of this State under date of June 4, 1919, in which is set forth an official opinion on the construction placed on section 36½ of the Public Service Commission law of Nevada, which became effective April 1, 1919. This opinion reads as follows:

Replying to your letter of April 29, calling for official opinion on the construction placed on section 36½ of the Public Service Commission law, we have to advise you as follows:

The section referred to provides:

Every public utility owning, controlling, operating, or maintaining, or having any contemplation of owning, controlling, or operating any public utility shall, before beginning such operation or continuing of operations, or construction of any line, plant, or system, or any extension of a line, plant, or system within this State, obtain from the Public Service Commission a certificate that the present or future public convenience or necessity requires or will require such continued operation or commencement of operations or construction. * * * Upon the granting of any certificate of public convenience, the Commission may make such order and prescribe such terms and conditions for the location of lines, plants, or systems to be constructed, extended, or affected as may be just and reasonable.

The cardinal point to which your determination should be directed in the premises is the convenience and necessity of the traveling public, to subserve which you may prohibit the establishment of competing lines, where the competition would not ultimately redound to the public good, but you would not have power to prohibit the continued operation of a competing line already established, since an attempt so to do would be a confiscation of property and property rights without just compensation being made. Nevertheless, you may so regulate the continued operation of an established competing line so long as such regulation does not amount to prohibition thereof under the guise of regulation. In doing so, the paramount question is the convenience and necessity of the public, and you, therefore, have the right to cause the competing line to be one—not only in name, but in fact—operating on fixed schedules as to time and fares, and with or without passengers, because, if it may operate only when it is afforded business and for fares that may be offered at the time, it is apparent that ultimately such operations cannot tend to the public good, but to the absolute injury of other bona-fide competitors, heavily financed and taxed, and always operating, with or without business. In arriving at your determination in the premises, there are other elements to which you should give weighty consideration. While respective competitors, in established lines, may have vested property rights therein, it is a principle of law that he who is prior in time, if the public good demand it, should be held to be prior in preferential right.

In conclusion, while you have these broad powers, there should be no arbitrary exercise of your functions, but the same should be so exercised with a discretion, which will redound to the public good as based upon the evidence adduced before you.

By order of the Attorney-General.

Respectfully submitted,

ROBERT RICHARDS.

Deputy Attorney-General.

At a regular meeting of the Commission held at its offices on June 7, 1919, this opinion was duly considered, and on the basis of same the following rules and regulations were formally adopted to govern the question of the issuance of certificates of public convenience or necessity to public utilities, as defined in the Public Service Commission law of this State, either contemplating the commencement of operations in

a territory already supplied with service similar to that which is to be furnished by such utility or utilities which are at the present time operating in competition with other utilities furnishing a like service and which desire to continue operations:

RULE No. 1. The term "public utility," as used herein, shall mean and embrace all corporations, companies, individuals, their lessees, trustees or receivers (appointed by any court whatsoever), defined as public utilities in section 7 of chapter 109 of the Statutes of Nevada for the year 1919, approved March 28, 1919, and effective April 1, 1919, commonly known as the Public Service Commission law of Nevada.

Further. The term "public utility," as used herein, shall also embrace all automobile common carriers as defined in General Ruling No. 3 of the Railroad Commission of Nevada, dated December 14, 1918.

RULE No. 2. Every public utility having any contemplation of owning, controlling, or operating any line, plant, or system shall, before beginning such operations or construction of any line, plant, or system, or any extension of a line, plant, or system within this State, obtain from the Commission a certificate that the future public convenience or necessity will require the commencement of operations or construction contemplated; *provided*, that public utilities contemplating the construction and operation of any line, plant, or system in a city, town, municipality, community, or territory not then served by a public utility of like character shall not be required to secure such certificate; *and provided further* that a municipality constructing, leasing, operating, or maintaining such utility shall not be required to obtain a certificate.

RULE No. 3. Every public utility owning, controlling, operating, or maintaining a line, plant, or system in any city, town, municipality, community, or territory served by more than one utility of a like character, and desiring to continue the operation or maintenance of its line, plant, or system, shall obtain from this Commission a certificate that the present or future public convenience or necessity requires the continued operation and maintenance of such line, plant, or system; *provided*, that nothing herein shall be construed as requiring a public utility to secure such certificate for any extension within any town or city within which it shall theretofore have lawfully commenced operations, or for an extension into territory either within or without the city or town contiguous to its line, plant, or system and not then served by a public utility of like character.

RULE No. 4. Pending the action of the Commission on applications for certificates of public convenience or necessity as provided for under Rule 3, the public utility applying for such certificate may continue the operation and maintenance of its line, plant, or system.

RULE No. 5. Public utilities applying for certificates of public convenience or necessity as provided for under Rule No. 2 will not be permitted to construct, operate, or maintain a line, plant, or system, until such time as a certificate may be issued by the Commission.

RULE No. 6. In issuing certificates of public convenience, the Commission will make such order and prescribe such terms and conditions for the location of lines, plants, or systems to be constructed, established, operated, maintained, extended, or affected as may be just and reasonable.

RULE No. 7. The Commission may, after hearing, issue or refuse to issue certificates of public convenience, or to issue certificates for the construction of a portion only of the contemplated line, plant, or system, or extension thereof, and may attach thereto such terms and conditions as in its judgment the public convenience or necessity may require.

RULE No. 8. No public utility beginning, prosecuting, or completing any new construction, extension, or operating or maintaining any line, plant, or system in violation of this order, will be permitted to levy any tolls or charges for services rendered, and all such charges shall be void.

RULE No. 9. It is unlawful for any public utility to discontinue, modify, or restrict service to any city, town, municipality, community, or territory theretofore served by it, except upon twenty (20) days' notice filed with this Commission specifying in detail the character and nature of the discontinuance or restriction of the service intended, and upon order of the Commission permitting such discontinuance, modification, or restriction of service.

RULE No. 10. Public utilities applying for certificates of public convenience or necessity, as provided for in Rules Nos. 2 and 3 of this General Ruling, must make such application in writing, verified by the applicant, and shall specify the following matters:

(1) The name and address of applicant and the names and addresses of directors and officers, if any.

(2) The city, town, municipality, or territory in which or over which applicant is operating and maintaining the line, plant, or system, or proposes to construct, operate, or maintain a line, plant or system.

(3) The character of service to be rendered. If a transportation line, designate whether passenger, freight, or express, or two or more of such services. Automobile common carriers will give a brief description of each vehicle which applicant intends to use, including the seating capacity thereof if for passenger traffic, or the tonnage capacity if for freight or express traffic.

(4) Transportation companies will file copies of proposed time schedules, or time schedules which may already be in effect.

(5) A schedule or tariff showing the fares, freight rates, or charges for services which applicant proposes to establish or has already established.

Applicants who have already complied with the law in the matter of filing rate schedules may simply refer to the schedules which have been legally filed with the Commission.

RULE No. 11. No application for a certificate of public convenience will be granted without a hearing. Upon receipt of an application, the Commission will, in its discretion, fix a time and place for a hearing on said application, which time shall not be less than five (5) days subsequent to the filing of the application.

PUBLIC SERVICE COMMISSION OF NEVADA,

By E. H. WALKER, *Secretary*.

Dated June 7, 1919.



CARSON CITY, NEVADA

STATE PRINTING OFFICE . . . JOE FARNSWORTH, SUPERINTENDENT

1919

THE LABOR PROBLEM

A Discussion by

The Hon. EMMET D. BOYLE, Governor of Nevada

In the Governors' Conference, Tenth Annual Session, at
Annapolis, Maryland, on Tuesday,
December 17, 1918

Program: "Reconstruction Policies."
Topic: "State Labor Policy."



CARSON CITY, NEVADA
STATE PRINTING OFFICE—JOE FARNSWORTH, SUPERINTENDENT
1919



Mr. Chairman, Ladies and Gentlemen:

In the multiplicity of problems confronting the governments of the world, the Nation and the States today, it may be said that the problem of establishing proper social and economic relationship between employer and employee is at once the most urgent and the most difficult.

On its solution may depend the lives, as such, of new democracies abroad. Into it enter, at home, the passionate hopes of millions of men and women in every social group that the inherent morality of a great democracy may so assert itself as to give living and immediate proof of the ability of a republic to automatically provide in practise the social justice which it professes as one of the articles of its creed.

With it comes the call for sharp differentiation (after a period of artificial control of the natural law governing barter and trade) in the consideration of human effort and that of the insensible agencies and commodities in all of our plans that go to the proper utilization of both.

It comes at a time when America may no longer claim position at the apparent forefront in the humanitarian movement of people from lower to higher stages through the instrumentality of government, for half the world is aflame with the fiery outburst of long-suppressed passion for the right to live as free peoples are presumed to live, and is going far afield in universal demands for industrial democratization. The hitherto controlled and outwardly docile people of the central empires, freed at last from the yoke, are rioting in an uncharted sea of impatient and impractical means to their idealistic ends; the feet of the Russians are not upon the ground and their heads are in the clouds; untutored and long-exploited peoples to the south of us are going through the bloody labor of a new birth of freedom which expresses in violence and destruction the age-old longing for the realization of ideals which live in the hearts of men everywhere.

British conservatism at home has already found counter-reflexes abroad in the action of those of her colonies which have sought in state socialism a remedy for the social and industrial ills growing out of the restraints of the home country. The wage-earners of England, organized in a great political group, are violently assaulting the traditional barriers of national conservatism which have only *seemed* to hold them in measurable contentment in their various employments.

Education at home has been accompanied, as it inevitably must be,

by clearer vision of, and resentment at, the conspicuous and extreme standards of living established under our own social and economic conditions.

The frontier has gone. The tide of humanity which flowed from the Atlantic to the Pacific encountered, occupied, and developed unparalleled natural resources at every step of the way, and no American, while the whole West lay out of doors beckoning to him, need to have felt himself a wage-earner except as an incident in his progress to independence on his own property. It is far from my thought that I should convey the impression that these resources have been exhausted, but no one will arise to contend that the present remnant of the public domain offers today the opportunity to the individual which existed for him a few decades ago. Just what part the bounty of nature played in the development of our sturdy, balanced, individualistic national character, no one may say. That it was a great part no one will deny, so great perhaps as to prove a determining factor in the success of the world's first genuinely practical experiment in democracy which was ours. It will not be gainsaid that we are approaching the end of the period in which opportunity for the man of average talent lay all about us.

There is no occasion to refer in a gathering of this character, except in passing, to the history of industrial relations in America. Capital long since combined to correct the proven ills of unrestricted, cutthroat competition. When these combinations tended to be viciously monopolistic in character, the pressure of public sentiment brought into play restrictive laws, many of them overreaching in their effect, but all possessed of the saving grace of protection to the American ideal of individual incentive. With combinations in industry came combinations of wage-earners, and the faulty vision of big business, which invited rebuke in the form of restrictive legislation, has been matched by the faulty vision of workingmen who, in the pioneer days of the labor movement, sought to obtain their ends by unjustifiable means; who followed false prophets, and who injected unsound principles into their negotiations, conducted only too often by tactless and sometimes venal leaders.

Today industry is organized in part. While it can hardly yet be fully absolved from the charge of improper interference here and there with orderly processes of government and trade, we must admit, and cheerfully so, that intelligence—which is another name for morality—has superseded the sandbag which, within the memory of living men, was used by "Business" so ruthlessly on the individual and the Government alike. With this change in heart has come a relaxation of public pressure, and a consequent letting-down in general public regulation.

Likewise, labor is organized in part. The American Federation of

Labor has, on the theory of the survival of the fittest, become the spokesman of intelligent organized labor in America, and has injected a sound philosophy in the principles of the trades crafts for which it speaks. The Railroad Brotherhoods, comprising the great majority of the train-service operatives throughout the United States, have earned recognition by the public because of the intelligence of their direction. Combined in these groups are, perhaps, two and one-half million of the workers in America, all of whom are committed to a stable policy in contractual relations with employers. Conspicuously, partisan entanglements are avoided by these great organizations. They are attached to no party and inoculated with the virus of no false political creed. On the record, I make the assertion that the American Federation of Labor has stood consistently as the most practical and powerful single influence in the Western Hemisphere tending to divert the vision of working men and women from the alluring prospects supplied in socialistic theory to the more practical aspect of social life to be found in our true national ideals.

Passing the question of nationalization of the agencies of control for the moment, I think that I am justified in saying that, in general, organization tendencies in all industrial groups were proceeding in the right direction in the period which preceded the war, in the sense that the elements of decency and regard for the rights of others were appearing in more pronounced degree both in capital and in labor combines. The war itself came, perhaps, nearer fusing discordant elements on our own society than has ever any other agency which exerted its force within our boundaries at any time. The purity of our purpose in the enterprise; its humanitarianism, *per se*; the democratization of recruiting methods through the Selective Service Act; the uniting of a nation in a common cause and the universal assumption of burdens and sacrifices by rich and poor alike—all tended to promote more wholesome relations, and I am inclined to think that not even the insidious propaganda of professional politicians, who seek issues in the varying viewpoints of social groups as the basis of sharp internal political discussion and dispute, will ever succeed in making us as bad again as we were before the war began.

To a greater extent than ever before, employer and employee sat in council together and abandoned the old and brutal method of approach and settlement where differences arose. Better still, each element in the transaction came out of each conference with a viewpoint slightly altered as to relative equities, and permanent benefits will flow from this.

The legislation of the period indicated a search for the true boundaries which should be established in the prohibition of capital combinations. It strove likewise to express a higher sense of social justice in

many of the measures affecting labor, so when hostilities ceased we were, perhaps, seeing industrial problems in better perspective than ever before. But the war is won, and we have to consider problems of readjustment. In the labor question there are many hopeful signs at home. The air abroad is laden with the germs of political, economic, and social sophistries, and "the wind bloweth where it listeth." At home we recognize this as the age of combinations, controlled combinations, if you please; the age of control that still leaves us the individual incentive which, with other things, has made us a great people. If it is the age of capital combinations, it is the age of wage combinations, and no one will arise to successfully assert that mankind as represented in those who toil has not benefited by the existence of organized labor in the past any more than he will assert that competition among laborers, unrestricted by organization, would not have continued a policy proven to have reduced the standards of citizenship, public health, morality, and intelligence.

But the cessation of hostilities has set up potential elements of disruption at home. Overnight, following the signing of the armistice, the business of war—the Nation's one paramount industry for nearly two years—ceased as far as utility was concerned. At the moment munition workers and those who engaged in the winning of the raw materials, sent in veritable floods to the factories for conversion into engines and instruments of war, are already seeking or must soon seek a peace-time occupation. The change of condition ramifies into every section of land; into the cotton-fields of the South, eight per cent of the product of which was taken by the Government; into the farms which rose superbly to the task of feeding the warring nations; into the mines of coal and copper, lead, iron, and the multifarious metals used in war or theretofore secured in import; to the mines of precious metals which aided in the protection of our money metal reserves and in the meeting of our oriental trade balances; into the forests which produced lumber for ships, for aeroplanes, for vast cantonments, and for stupendous emergency construction at home and abroad—in short, into every section of the land which brought into play agencies to care for the exigencies of the world's greatest and most destructive enterprise.

Statisticians of the Department of Labor estimate that there may be as many as five million of these war workers released, and it is obvious that they will be released in the near future, for no government would be supported in a policy which, even as an insurance against possible industrial disorder, would entail the expenditure of billions for material and equipment that we fondly hope will never again find a useful place in the products of civilization. So the rate of demobiliza-

tion of civilian war workers is, to all intents and purposes, beyond governmental control.

In addition to naval forces, the demobilization of which does not appear imminent, there were, at the time of the cessation of the hostilities, one million six hundred thousand men in the military service in the United States and two million one hundred thousand abroad. I am advised that the policy of the Government will provide for the release of men in domestic camps at whatever rate they may be absorbed, perhaps no faster.

Many undetermined factors enter into the problem of demobilizing the overseas forces. The rate at which these men, released from military service, will flow back into normal industries, and thereby affect the labor market, cannot be predicted. The men under arms abroad may be released at a rate that meets the requirements of military expediency, and in this enter the still undetermined factors of the conditions of peace and the requirements of the use of men for police purposes in Europe. The rate of transport from Europe to the United States depends upon the available shipping facilities, which, in turn, hinge upon many agreements and factors still undeterminable. Among these may be mentioned the allocation of ships between trade, the transport of British Colonials and the transport of Americans; the part of indemnity to be paid by Germany which will be accepted in the form of ships; the gains, in effect, of shipping to be made through the reorganization of trade routes and the discontinuance of convoys; the conversion of cargo ships into transports, and the separation and direction of movements of supplies and men. In the same connection comes the question of the part we are to play in the reconstruction of Europe, still undetermined pending international understandings with Belgium, France, and perhaps Russia and the Balkan Allies.

The rate of the flow into the labor market of these millions of men should, if we are to avert the calamity of a period in which great numbers of workers are to be without employment, depend upon our capacity of absorption. There will be, doubtless, some extension of essential industries, so-called; a considerable expansion of the industries curtailed because of war-emergency needs, and a considerable absorption by the industries which were entirely suspended over the period of the war. There will be old industries reconverted to peace uses, and new industries made to play a part in promoting the peaceful development of America and the nations of the world. New industries will doubtless grow likewise out of the world-wide problems of reorganization. The question of an immigration policy enters.

The availability of credits, public confidence in the future, and our domestic and foreign trade policy will have an influence on this rate

of absorption. The rate of demobilization of the armed forces is within the control of the Government. So, with nearly nine million men and women to be thrown on a disorganized labor market within an undetermined period, and with that market subject to influences—partly psychological, partly problematical, because of undeterminable factors—no man may today predict the exact nature and extent of the future labor problem in the United States. Certain it is that unemployment will spell discontent, the play of unfortunate influences which make for prejudice and class distinctions, and, perhaps, the importation and acceptance by idle and discouraged groups of existing European ideals quite out of tune with our own.

Among the great masses of the American people, the Utopian thought of Russia now struggling for practical expression there in a typical atmosphere of ignorant and brutal revolution, will find no welcome. Yet radical groups which have been troublesome in America are ready to seize upon anything to stimulate their activities among the discontented masses, and experience has proven that they succeed measurably when conditions are such as those which we have at this time reasonable cause to fear.

The Spartacus group in Germany represents the Bolshevich element there. France has in her masses a powerful Socialist group. The plausible and alluring arguments of this ultraradical European political faction will touch only relatively few of our people—yet it cannot be gainsaid that this foreign political disease is contagious.

Coming nearer home, let us consider the attitude of the working masses of England. There, the British Labor Party—representing a combination which might be likened to that of the American Federation of Labor and all other organized labor groups with the political socialists in our own country—is conceded by students of the situation a representation in Parliament of as many as one hundred seats in the total of six hundred seventy in the House of Commons. Its demands include a universal minimum wage; insurance against unemployment; democratic control of industrial methods, through participation by the workers in such control “on the basis of common ownership of the means of production” and “equitable sharing of proceeds among all who participate in any capacity in production; state ownership of lands; the nationalization of railways, mines, and electric power, canals, harbors, roads, and telegraphs, and expropriation of industrial insurance companies; government control of all industries bearing directly on the cost of living; the practical exemption from taxation of small incomes, and for the taxation of large incomes on a plan which does not stop short of a capital levy to care for the war debts of the nation.”

The program of American spokesmen of labor appears very modest

indeed when compared with these demands of our British brothers. The American Federation of Labor proposes now only the extension of the eight-hour-day principle; the right of workers to bargain collectively; the intensive organization of the unskilled workers, and the fundamentally sound proposition that an extension of opportunity for intercourse and exchange of viewpoints between workers and managers be provided forthwith. The Department of Labor emphasizes the importance and urgency of the last-mentioned proposal and does so, I think, with clear vision of industrial needs and with the constructive statesmanship which follows such vision.

In the confusion following the cessation of hostilities with its attendant uncertainties as to the immediate future came, in advance of any diagnosis, the usual avalanche of prescriptions of economic nostrums aimed to cure our potential industrial ills. It became apparent that emergency trade bolsters and restrictions favorably affecting the prices of American products and manufactures would have to be withdrawn. Seeing no immediate and practical plan to force down prices on commodities and manufactures other than those produced by themselves, employer groups throughout the country began a noisy clamor for the immediate reduction of wages as a precedent to the downward course of prices generally. It was alleged that the wage factor in American production constituted fully seventy per cent of the value represented in the salable product and the whole structure of excessive prices was upheld by immoderate compensation exacted by workers over the war period. Mr. Gompers, President of the American Federation of Labor, joined by the Department of Labor and individual wage spokesmen, replied in no uncertain terms that labor would resist any attempt to interfere with wage scales and hours, and these declarations brought forth an eager and spontaneous condemnation from extremists on the other side of the question, together with an outspoken presentation of the theory that a "show-down with labor was imminent." In certain financial groups the argument was advanced shamelessly—by lesser lights in the world of business and industry, it must be confessed—that deliberate and organized curtailment of production would effectively starve the insolence out of the now arrogant wage-earner. Happily, this inhuman, not to say insane, policy found no favor in the eyes of the real leaders in American industry. Particularly refreshing is the prophecy of Mr. Charles Schwab that labor is inevitably destined to share directly in the control of all industries; that of Judge Gary of the United States Steel Corporation that his company contemplates no reduction in wages, and the expressions of many others that the downward deformation of the wage curve must be preceded by readjustments in the other factors of production.

In this connection it is interesting to note just how labor (treated for the purpose of immediate argument as a commodity) did capitalize its opportunity during the war.

It may smack of the academic at this time to attempt to analyze the causes underlying the upward trend of prices since the inception of hostilities in Europe. Prices are what they are, and it may appear that the obscure causes for existing conditions have no part in an address of this character. It is necessary, however, to say that the insatiable demand for material and men during the past two years does not account wholly for the prices in all commodities now prevailing. In the case of most materials the intervention of regulating machinery prevented the rise of prices to even higher levels than those actually attained. It is interesting to note that steel, coal, wheat, cotton, and the bulk of the big raw-product tonnage rose to figures averaging more than one hundred twenty per cent advance over pre-war prices. Elaborate data collected by the Bureau of the Census, by the Department of Labor, and by private statistical bureaus proved that the cost of living, so-called, reached an average over the whole country of more than sixty per cent increase over normal. These increases would have been greater in the absence of control agencies inaugurated by the Government. Nor was, perhaps, the law of supply and demand alone at work in this business. To quote from an admirable paper presented by O. P. Austin, Statistician of the National City Bank and former Chief of the United States Bureau of Statistics, Department of Commerce: "In the matter of currency, 'money,' so-called, the quantity available in every country at war will be very much greater than at the beginning, but its purchasing power will be reduced. The total quantity of 'money'—gold, silver, and paper—in the world has increased from thirteen and a half billion dollars at the beginning of the war to about thirty-two billion dollars at the present time, and most of this increase has occurred in the belligerent countries. Nearly all of this increase, however, is in the form of paper—notes issued by the governments or by the great banks which serve them—and the increase in this paper money has been far greater than that of the metallic reserve which normally forms its support. The world's 'uncovered paper,' which at the beginning of the war was slightly less than \$4,000,000,000, is now fully \$20,000,000,000, and this increase has occurred chiefly in the European countries participating in the war. That this great increase in paper currency is a species of inflation, and perhaps 'flat money,' cannot be doubted. But it cannot be expected that the increase in quantity of manufactures will be at all proportionate to the increased currency available for the operation of the factories. Labor and raw material will be much

higher in terms of the depreciated currency." So inflation—the effects which are not to be immediately remedied—had its part in upward price tendencies, and will tend now to establish new normal levels higher than the old even on the restoration of the exact conditions in America which prevailed before the war.

Unquestionably the wage-earner in 1918 found himself possessed of an unusual sense of security in his employment. From the prewar conditions—when from one million five hundred thousand to two million workers were throughout every year unemployed, and when greater numbers suffered the effects of broken and casual employment because there were not jobs sufficient to employ all—the country went to a condition in which men were everywhere in demand. No devices were installed to prevent the operation of the same processes of control on the labor element in production as were applied in other cases. The law of supply and demand might have had full swing had labor pressed to the full its new-found advantage.

As a device to enforce compliance with the terms of "hours-of-labor" agreements and laws, organized wage-earners have secured generally the adoption of the "time and a half for overtime and double time for Sunday work" principle in the larger industries. When shipbuilding began on a colossal scale, together with the production of armament and munitions, the Government found itself unable initially to enter into contracts with employers, because of the uncertainty of the markets, on any basis other than the so-called "cost-plus" plan. Great drafts were made on the labor market everywhere. Tremendous competition for labor sprang up between individual contractors. It was no concern to them under a cost-plus contract what sums of money workmen were paid for their services, and recruiting by the agents of one contractor in the labor ranks of another became common, serving to bid up certain wage scales to inordinate figures. In part this was corrected by the activities of the War Labor Board, but conspicuous instances of exceptional pay, secured by workmen under these conditions over the war-time period, are uppermost in the minds of the public and tend to blind us to the true facts in the case. Statistics carefully compiled by governmental agencies throw new light on the situation. In the thirteen principal cities in the country union wage scales since 1907 have increased from a low instance of nine per cent in New Orleans to thirty-eight per cent as a high instance in the Pittsburg district. These figures are based on the contracted hourly or weekly wage on the contracted scale of hours. They do not take into account, as I interpret them, extra pay derived from overtime work. Most illuminating of all of the data is that which compares the present purchasing power of the union wage throughout the United

States as measured in food at the present price of that element in the cost of living with the same conditions in 1907. This data proves conclusively that the advance in the price of commodities which men must buy to live increased in much greater proportion than did the compensation of the same men. Rates of wages per hour advanced from a relative of ninety in 1907 to one hundred fourteen in 1917, an increase of twenty-seven per cent. Retail prices of necessary commodities advanced from a relative of eighty-two in 1907 to one hundred forty-six in 1917, an advance of seventy-eight per cent. It is obvious from government statistics that the wage and hourly scales referred to by the Department of Labor and by Mr. Gompers, in the statements attributed to them in this address, constitute in purchasing power today only seventy per cent of the earning capacity of the workman in the same craft ten years ago. From this it will be deduced that the wage scale still lags far behind the scale of prices reached by the commodities which determine standards of living for the worker. To go further with statistical matters of interest in the study of this subject, approximately three billions of dollars were collected from industries during the year period ending June 30, 1918, as a proportion of profits from industries in excess of normal prewar earnings. What proportion of the total excess profits of the country is represented by these figures, I have no means of determining with precision. A certain familiarity with the law, its extension, and its operations justifies the assumption that not more than forty per cent of the actual excess profits were absorbed in taxes over the period named. On this assumption, not less than seven and a half billion dollars were earned by industry of the United States in excess of normal earnings, affecting thereby the distribution of the burden of the cost of conducting war upon the whole mass of the people. The laborer paid his fair part in this by virtue of the differential between his wage increase and the increase in the cost of living. Likewise in this connection the Bureau of the Census and personal investigation reveal the fact that the ratio of wages to the total aggregate cost of production, distribution and sale is on the average more nearly forty in each one hundred parts than the seventy so frequently referred to by the advocates of immediate wage reductions. I regret that I cannot here supply you with specific information relative to the actual percentage of each of the elements generally conceded by economists as entering legitimately into the operation of production. These are: *First*, rents, royalties, or the value in place of raw materials as one chooses to define it; *second*, capital; and, *third*, labor. Figures should be available to indicate the extreme wage burden that American industry could stand after practical economies had been effected in the other factors referred to.

Unquestionably a limit would be reached before the ideals of many social dreamers were realized, and the problem would then evolve itself into one of equitable distribution. It is not going too far, however, to say that quite apparently industrial economy can be effected immediately in the interest factor which is apparently overloaded, at least to the extent of excess profits referred to in these remarks. Again, labor must assume some of the initial risks of enterprise, and managers of industry must in turn recognize that the cost of mismanagement should not be wholly assessed against the wage groups.

If a solution of the problem is to come at all, it must come by cooperative consideration. I may pause to refer to the obstacle standing in the way of such a reform. The mutual suspicions of the employer and employee will relate back to days when the employer viewed organized labor as an insolent interloper in the field of commerce, and when occasional labor leaders carried their following into disrepute by unethical, not to say lawless, counsel. Just as there exist today capital groups capable of indecent business methods, so do there still exist labor groups standing for policies which are abhorrent to every principle to which the American people is committed.

In the western country many managers, constitutionally inclined to be fair and even generous in their treatment of men, have been diverted from clear-eyed progressive consideration of the labor problem by recollection of bitter experiences with misguided men, who delegated the formulation of their policies and the leadership of their cause to individuals who would be suffering only moderate penalties were they adjudged criminally insane by an outraged public opinion.

I.W.W.ism, with all of its false philosophy and brutal and inhuman plans for the correction of industrial and social ills, still lives in an organized form. The specious arguments of those who control it still call to its membership honest men who see at hand no other organized agency to secure relief for them from actual exploitation. Confidence is lacking in the integrity of purpose of many existing organizations, both in the minds of workingmen and employers. Such men crave affiliation with a properly organized trade union, and are merely awaiting the appearance of a Moses to "lead them out of the wilderness."

The State Government is peculiarly equipped to bring the human elements in industry to better understanding of one another.

Governors have complained of the gradual usurpation of the state power by the Federal Government.

The Department of Labor is today undertaking the great program of education which must precede all genuine social and economic reforms. It is perhaps proper that the labor problem, which must be

viewed in a wide survey, should be settled by agencies not too much decentralized—but the States can cooperate usefully.

I may be pardoned if I suggest, however, that the cause of the declining function of the State in the affairs of the Government may be traced in some measure to the instability of state policies, and to the sometimes limited vision of those of us who are charged with executive responsibilities. Here appears an opportunity for constructive service.

Upon the State, wherever the power of direction may be vested, will fall the problem of policing the territory affected by social disorder.

It will be the State that will suffer the most acutely from every dispute.

Public opinion no longer approves the brutal methods of the past employed in the settlement of controversies of this character. The labor problem of today is "the problem of problems" confronting every government. It is a problem with which is inevitably linked the whole question of human advancement. It is no longer a matter to be left within the States, to the casual and mediocre appointee. It deserves personal consideration along practical, constructive lines at the hands of every Chief Executive. It offers opportunity for service which carries with it unparalleled possibilities of reward in the form of rapid approach to what should be the ideal of every government—a happy, harmonious, and prosperous people.



BEFORE THE PUBLIC SERVICE COMMISSION OF NEVADA

IN THE MATTER OF THE APPLICATION
OF ALBERT PEARL FOR A CERTIFI-
CATE OF PUBLIC CONVENIENCE TO
ACT AS AN AUTOMOBILE COMMON
CARRIER.

APPLICATION
No. 16

Appearances:

For Applicant: ALBERT PEARL.

For VIRGINIA AND TRUCKEE RAILWAY, Protestant:

F. E. MURPHY, Attorney,

H. COFFIN, Superintendent,

H. L. GRIFFITHS, General Freight Agent.

OPINION

SHAUGHNESSY, *Chairman*:

This is an application for a certificate of public convenience to operate an auto-truck freight service between Reno and Virginia City, in competition with the Virginia and Truckee Railway, at fixed rates for daily round-trip service between said points.

The matter was heard before the Commission on July 10, 1919.

Applicant pleaded that he began operating an auto-truck freight service between Reno and Virginia City in August, 1918, and that, therefore, his application should be considered in the light of authorizing the continuance of an established service. Objection was made by counsel, F. E. Murphy, who appeared on behalf of the Virginia and Truckee Railway, that applicant had failed to file his rates and conform to other rules and regulations of the Commission until he filed the present application, and that, therefore, his line could not be considered by the Commission as having been lawfully established and operating heretofore. This objection is well taken, and the Commis-

sion will, therefore, confine its consideration of the case to those features which relate to the future. In other words, the application will be considered in the same light as if no operations had heretofore been attempted.

It was shown by the applicant that he had purchased necessary equipment and was prepared to operate said service; further, that he would undertake to operate a daily service the year round by the Geiger Grade route during the spring, summer, and fall months, and via the Carson route during the winter months; that he would schedule his trucks to leave Reno at 8 a. m. and arrive at Virginia City at 11 a. m., carrying meat, vegetables, groceries, provisions, and furniture at practically the same freight rates as those maintained by the Virginia and Truckee Railway; and that said rates and service would include the receipt of goods from the warehouse at point of purchase, and store-door delivery at point of destination, thus saving delay and additional cost to consignor and consignee at both ends of the line for drayage service to and from the depots when shipments are made by the Virginia and Truckee Railway.

It was also shown that if this freight were shipped by the Virginia and Truckee Railway, it would not reach Virginia City until 6 p. m., or too late for the trade during the day in question; from which it appears that there would be a saving of one day in time if the establishment of the auto-truck line in question is authorized. While it was contended that this less-than-carload freight service could move by express and meet the said 11 o'clock morning delivery at Virginia City, it was shown that the rates were higher, and, therefore, could not be fairly compared with the railroad freight and truck service in question.

For business from Virginia City to Reno, returning on the afternoon trip, it was shown that applicant would depend largely upon the movement of second-hand lumber and materials which are being scrapped at that point, and that the charges for such service—taking lumber, for example—would be at the rate of \$6.50 per thousand feet to Reno, or direct to the ranches intermediate and tributary thereto.

In opposition to the application, Attorney F. E. Murphy contended that his company is operating an all-the-year-round express, freight, and passenger service daily between Reno and Virginia City; that a high-grade service is being rendered; that the business between said points is sparse and that the railroad is able to take care of a much larger volume of business than is being offered; that the railroad in question is a heavy taxpayer; that in the regulation of such automobile transportation lines as may be authorized, the Commission should require the establishment of depots at the terminals and that said

lines should be required to accept, receive and make delivery of traffic at said depots; and, finally, that the application of Mr. Pearl to operate an automobile truck service between Reno and Virginia City should be denied because no good or sufficient reasons had been shown why the competition in question should be authorized.

In response to queries for the information of the Commission, Attorney Murphy stated that his company was not prepared to arrange for warehouse and store-door receipt and delivery of the less-than-carload freight in question; that it could not change its freight-train schedule to reach Virginia City at or about 11 a. m. in the forenoon; and that it could not reduce express or passenger-freight rates to the basis of the proposed rates offered by Mr. Pearl.

The Act under which we are proceeding is section 36½ of the Public Service Commission law as amended by the Legislature of 1919. This section seems to clearly provide that applications for certificates of public convenience must be made to the Commission for authorization to continue the rendering, the extension and the improvement of service by established public utilities, and by new or invading utilities where proposal is made to establish facilities for the rendering, extension, and improvement of the public service either in fields already served or in those where service has not theretofore been given.

In the investigation of applications for certificates of public convenience made by established or similar or improved public service agencies for authorization to operate within defined sections, the Commission understands that the following elements are, under the law, presented for consideration in reaching its conclusion authorizing or rejecting said applications:

That in so far as there may be no restriction to the natural progress and improvement in the art of rendering modern and efficient service, the investment and the business of an established utility where it has been wisely and beneficially made and the public is being adequately and economically served, should receive protection. In other words, the established utility's field of operations and business should be protected from invasion by a competing utility or utilities in those cases where only the same or an equivalent service is offered, or where it may reasonably appear that by the establishment of additional utilities the grade of a public service may be seriously impaired by such a division of the revenues available that ultimately the operations could not be profitably conducted and at the same time maintain the facilities in a proper state of efficiency. Further, in the same behalf, where the granting of the application of a competing utility or utilities would call for unnecessary investment and duplication of plant facilities and by the division of the earnings which would follow in the race for

the survival of the fittest, it reasonably appears that the operations may result in loss to the investing public and serious impairment of the service, protection to the public should be accorded.

That in those cases, however, where it appears after hearing and investigation that a more modern and improved service and at better rates is offered upon the application of a new utility than is being afforded by the established utility occupying a given field, said established utility may be given an opportunity to modernize and extend its service facilities and operations and meet the rates in question offered if satisfactory showing is made that it is financially able and willing to do so within a reasonable time. In such cases it will not be unreasonable to afford protection to the established utility and exclude the incoming utility from establishing operations. But, if it is shown that the established utility is unable, without unreasonable delay and uncertainty, or if it refuses to modernize its facilities and meet the improvement in service and rates offered, it will then be justifiable and reasonable to grant the application and authorize the incoming utility to establish its business in the interest of progress and modern improvements in the art of rendering public service.

When two or more applications are before the Commission for determination covering similar or the same service conditions within a particular territory, or in the event that two or more competing utilities are already established, the question of priority in time and the question of the effective regulation of the utilities in such manner as will render proper service, while at the same time insuring a modern and adequate system of operating facilities, is entitled to consideration. In such cases the end sought will be the modernizing and the bringing of the facilities up to a satisfactory standard for the rendering of an adequate public service, and it therefore follows that effective regulation of facilities, rates, and practices should be enforced by the Commission in order to afford protection to the utility or utilities which can fully and beneficially serve the public and, at the same time, make sufficient revenues to properly maintain their system or systems and thereafter continue in the public service profitably.

Manifestly, the public service business has its limitations and, unless there is effective regulation of the utilities in question, and in certain cases a denial of the applications of incoming utilities for authority to participate in the public service in sections already adequately served, such unrestricted competition would result in obsolescence and deferred maintenance in the plant and facilities to such an extent that the public service would not only be badly demoralized, but also necessary improvements therein from time to time could not be afforded.

The established utility in point of time and service is, under the

law, and subject to the aforesaid qualifications, entitled to the larger consideration, and, although no action can be authorized which will have the effect of impeding progress and improvements in the art of rendering public service, yet it may fairly be given the opportunity to reconstruct and make such improvement in its plant, system, or facilities, including the extension thereof, as will enable it to adequately meet the proposed competition in service and rates offered by the new utility. But, if the established utility elects not to make the improvements and extensions, including the establishment of the lower rates, proposed by the invading competitor, or is unable to do so, we are aware of no action which can, under the law, be taken to prevent the establishment of such improvements in service and rates to the public, nor do we think that in such cases there should be any restriction exercised.

In the case before us it may be noted, by way of illustration, that it is conceivable that the Virginia and Truckee Railway could, if desired, extend its operations within the field of transportation to the ownership and operation of its own auto-truck service at Reno, Virginia City, and Minden, from which it follows that fair opportunity is afforded for it to engage in the service here under consideration. Further, by the joint operation and interchange of business with established auto-truck lines on the basis of an agreed division of the rates for terminal and joint-haul services to be paid to the truck lines, the railroad should be able, through the operation of one or two additional baggage cars on its morning and evening passenger trains, to establish and render a high-grade through warehouse to store-door and line-haul service to and from Reno, Carson City, Minden, Virginia City, and all important rural and established centers tributary thereto.

The extension of such a joint railway and auto-truck service, while giving to the public the convenient and extended service desired, would, at the same time, retain to the Virginia and Truckee Railway a substantial revenue which would otherwise be lost. It would also bring to the railroad, for the long rail hauls between Reno, Carson City, Minden, and Virginia City, business which could, and doubtless would, be secured by its joint auto-truck lines, that is now moving altogether by truck and in which the railroad secures no haul or revenue.

The auto-truck can be made a valuable auxiliary to railway terminal and local freight, express and passenger service by progressive recognition and cooperation on the part of the railway managers. The railways have well-organized and established financial, commercial, operating, and shop organizations that can be very advantageously and beneficially devoted to an enlarged public service, and there is, therefore, good reason why the rail carriers should cooperate in making

successful the aforesaid extensions and improvements in transportation to terminal, interurban and nonrailroad-point territories for the purpose of not only retaining their established business, but also in order to bring to their lines increased traffic and revenues which they otherwise would not secure. In any event, it must be recognized that, because of the improvement in the art of transportation which is being offered and rendered by the auto-truck and -stage lines, the service has come to stay. Large capital is invested in the automobile industry, and, in consideration of the flexible and expeditious transport service which the auto-trucks and -stages place within the reach of every farmer, mercantile shipper, and the public, this improved transportation agency is meeting with deserved approval and encouragement.

It may be noted, in passing, that the commercial shippers find the extended service afforded by the auto-truck lines attractive and valuable for the reason that there is an added convenience and adaptability in shipments not heretofore furnished. It is largely free from boxing and packing regulations and from the trouble of billing and drayage, and it is also practically free from damage in transit and of delay in tracing lost and astray goods. This makes an impression on customers that thus far has not been afforded in any other way. The service in question has also grown to a point where it is strongly appealing to the farmer as well as to the commercial and retail trade interests. With the trucks of a motor freight and express line operating on daily schedule past his place on the way to markets in near-by cities, the farmer is beginning to ship to market his surplus milk, cream, eggs, garden products, etc., as economically, or more so, than by rendering the service himself. It is also found highly advantageous because the farmer does not need to give the time of himself or that of his employees to the transportation of his products to market, and he is thereby enabled to spend this time and energy in the more important work of raising additional and better crops and live stock for the market.

For the reasons stated herein, we believe it must be recognized that there is now an established field for both the railroads and the auto-truck passenger, freight, and express lines, and that all of these agencies should for the future be established and regulated in the interests of the public service, and that this may be accomplished by the independent operation of each in certain sections, and in others by the joint operation of the auto-stage-truck and railroad lines in proportion as the public necessity and convenience may justify.

After full consideration of the record and the improvement service offered, the Commission is of the opinion that the application of Albert Pearl should be granted.

ORDER

At a regular meeting of the Public Service Commission of Nevada held at its offices at Carson City, Nevada, July 28, 1919, all members being present:

Pursuant to the foregoing conclusion, it is

ORDERED: That the application of Albert Pearl to operate a truck freight service daily between Reno and Virginia City, Nevada, be and is hereby granted.

BY THE COMMISSION,
E. H. WALKER, *Secretary*

[SEAL]

Dated July 28, 1919.

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UNIVERSITY OF NEVADA

23

RENO, NEVADA, 1919

TURKEY MANAGEMENT

Practical Suggestions on Selection, Feeding, Housing and Handling, with Special Reference to Common Diseases of Turkeys, their Recognition and Control



By

R. C. LOUCK, D.V.M.

Pathologist, State Veterinary Control Service

Printed at the

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CARSON CITY, NEVADA

ASSISTANCE IN COMBATTING INFECTIOUS DISEASES

The State Veterinary Control Service, working in cooperation with the Extension Division and the Agricultural Experiment Station of the University of Nevada and the State Board of Stock Commissioners, is now in a position to offer every facility for the diagnosis, prevention, and treatment of *infectious diseases* of live stock. This service includes laboratory diagnosis and the sending of veterinarians to investigate outbreaks of disease, and institute measures for their control by vaccination or otherwise. There is no charge for such service except the payment by the owner for such biological products as are actually used and which are supplied at practically cost price, being secured from properly licensed reputable commercial laboratories, except in a few instances where the materials needed are not on the open market, in which case they are specially prepared in the laboratories of the Department to meet the needs of the particular case and supplied free of charge.

This service, however, does not make any provision to care for surgical, obstetrical, or noninfectious disease cases, nor to provide inspection for interstate shipment of live stock, these being deemed outside the functions of public-service work and properly to be cared for by the owners and veterinarians in private practise.

Address all requests for assistance to the

DIRECTOR, STATE VETERINARY CONTROL SERVICE,
University of Nevada,
RENO, NEVADA.

TURKEY MANAGEMENT

By R. C. LOUCK, D.V.M.

Pathologist, State Veterinary Control Service

Turkey raising, as ordinarily engaged in upon the ranch, is a sideline. However, in some of the States there are men who are making the raising of turkeys the major portion of their business.

Unlike chickens, turkeys are not suitable for the backyard poultry raiser; they require range, and do not do well when confined to small pens and houses. The domestic turkey of today is a direct descendant of the wild turkey which was common throughout the United States a few years ago. Along with the other characteristics of the wild bird, ranging widely for food and roosting in trees, etc., are some of the most marked of the hereditary traits of the turkey of today. During the summer and early fall, if allowed free range, turkeys can find an abundance of food on the average ranch. About October 1 it is well to begin fattening for market, giving only a little feed at first, and gradually increasing the amount till the birds are marketed. Various feeds are used, corn or barley probably being the most common, but any of the ordinary grains answer very well if the birds are gradually worked up to a full ration. Increasing the quantity of feed too rapidly tends to produce diarrhea and kindred disorders. The marketing season for turkeys is very short, running only from the middle of November to the latter part of December.

SELECTION OF BREEDING STOCK

One of the fundamental and most important steps toward success in turkey raising is the selection of the breeding stock. Birds for breeding should be selected for vigor, size, shape, strong bone, early maturity, color of plumage, and other characteristics of the type desired. Most breeders prefer yearling hens and a vigorous yearling tom. Older toms are heavier and more clumsy and apt to injure the hens when mating. It is essential that the tom be unrelated to his mates, as inbreeding is perhaps more detrimental in turkeys than any other fowls. One tom with not more than six to ten hens will usually insure fertile eggs, as one mating is sufficient to fertilize an entire clutch of eggs.

HATCHING

Turkey hens usually lay about eighteen eggs in the first clutch and then become broody. They can, however, be broken up and will lay a second and sometimes a third clutch. Yearling hens will usually begin laying their first clutch about the middle of March and finish the first part of April, a second clutch late in April, and a third about the third week in May, depending upon how many eggs she lays and the promptness with which she is broken up on becoming broody. Hens that are allowed to hatch and raise a brood of poults after laying their first clutch often begin laying again in the fall, but poults hatched at

that time are of little value, as they require too much care and attention to carry them through the winter. Fall-hatched poults begin laying late the following spring, but they are immature at the time, and poults hatched from their eggs do not develop into large strong birds as do poults from mature stock. Turkey or chicken hens are usually used to incubate turkey eggs, although incubators are used where turkeys are raised on a large scale. In either case, about a week before hatching time, enough turkey hens to brood all of the poults should be allowed to sit. They may be given a few eggs from the incubator or from under chicken hens and allowed to hatch the poults themselves, or at night a newly hatched poult can be slipped under each turkey hen that is to be given a brood of poults and by morning they will take them. Turkey hens are very close sitters, and if managed properly they are the surest means of hatching turkey eggs that can be used. The incubation period of a turkey egg is about twenty-eight days; the first egg is usually pipped during the first part of the twenty-seventh day, the first poult hatched by the middle of that day, and the hatch completed at the end of twenty-eight days, although in extreme cases poults are not hatched before the end of thirty days. Turkey eggs are tested for fertility and dead germs, as a rule, on the tenth and twentieth days.

REARING OF POULTS

The average number of poults raised under ordinary conditions is about 50 per cent of those hatched out, or about seven poults for every turkey hen. By far the greater part of this loss occurs when the poults are quite young—that is, under a week old. Seldom are any lost after they are a month old unless there is an outbreak of disease. The high mortality among young poults is mainly from the following causes:

1. Exposure to dampness and cold.
2. Improper feeding and overfeeding.
3. Close confinement.
4. Lice.
5. Inherent weakness, the result of carelessness in selection of parent stock.
6. Predatory animals.

With the exception of predatory animals, all these losses are easily guarded against, experienced and careful turkey growers being able to raise a much higher percentage of the poults hatched.

As soon as the hatch is completed, the hen and brood are ready to be moved to a coop provided for them. This coop should be built to keep out the rain, well ventilated, capable of easy movement, and sufficiently roomy for a turkey hen to stand erect and walk about. There should be a separate coop for each hen and brood scattered about the ranch in well-drained locations where natural feed—such as tender green vegetation (grass, clover, alfalfa, etc.) and insects (particularly grasshoppers)—may be found. By moving the coop every day, the ground will be kept clean and the opportunity will be given for the hen and the poults to pick up fresh green feed inside the coop.

No food should be given the young poults for twenty-four hours after hatching; then hard-boiled egg, shell and all, minced finely and sprinkled lightly with black pepper, is a good food for the first few

days. Corn bread is looked upon with favor as a food for young turkeys. Likewise, cottage cheese is considered good. The ordinary commercial scratch feeds are used by most large raisers as a supplement to the natural food of the range.

Plenty of exercise is essential if the poults are to thrive. At all times, when rain or dampness does not prevent, the poults should be allowed to run in and out of the coop at will. Too much stress cannot be given to the necessity of exercise, and the only way to provide for this is to allow the poults every opportunity to range for feed outside the coop. After three or four days, when the poults are strong enough to follow the hen, she should be liberated from the coop and allowed to lead the young poults over the range. Care should, however, be taken to protect the poults from rains, etc., until they are three or four weeks old. This is best done by confining the hen to the coop at night and liberating her in the morning.

At the age of six weeks the young turkeys are old enough to go to roost. Practically all turkey raisers allow the birds to roost in trees or on fences or other roosts out of doors. In sections where high winds prevail it is customary to build the roosts next to a barn or shed, thus affording some protection. By driving to the roosting place and feeding them there every evening just before dark, young turkeys can be made to roost wherever desired.

FOODS FOR FATTENING FOR MARKET

In fattening turkeys for market an excellent plan is to begin about October 1 to feed night and morning, not feeding enough at the time but that the birds go away with their hunger only partially satisfied, and gradually increasing the quantity until they are given all they will clean up three times a day the week before marketing. In the matter of feeds a great deal depends upon the local conditions. In some localities the feeding period is started by feeding mixed wheat and oats and gradually changing to corn or barley. Old corn is more satisfactory than new corn. However, new corn may be used, but should be fed sparingly at first, as diarrhea may be caused by overfeeding with it. Confining turkeys during the fattening season has been tried to some extent, but with very little success. Those confined in pens eat heartily for two or three days, but after this they lose their appetite and begin to lose flesh rapidly. The better plan is to allow free range, and the birds soon learn to come to the feeding place for grain. Another point in favor of allowing them to range is the fact that they balance the ration by picking up insects, plant seeds, green vegetation, etc.

MARKETING

The marketing season is very short, running from the middle of November to the latter part of December. Most raisers sell their birds alive to poultry dealers; others dress their turkeys and sell direct to consumers or to city dealers. This phase of the industry is largely controlled by local conditions. The prices vary from year to year, but have had a very strong tendency to become higher the past few years, making this industry more profitable than heretofore. The Department of Agriculture, Washington, D. C., has prepared some very interesting publications concerning this phase of the industry.

DISEASES

To be a successful turkey raiser, one should have a practical knowledge of the more common ailments which affect this species of fowl. Of the diseases affecting turkeys, we will take up only those which are of the most importance from an economic viewpoint, and will consider them in the order of their importance and frequency of occurrence.

Blackhead

The scientific name for this disease is enterohepatitis. It is also designated as coccidiosis of turkeys. The common name (blackhead) is incorrect and misleading, as the head may become discolored during the course of other diseases and may show no discoloration when this disease is present.

Prevalence. This disease is prevalent wherever turkeys are raised. It more often occurs in flocks where large numbers of birds are confined too closely, or where range is limited and where sanitary arrangements are inadequate. However, it frequently takes its toll from the small raiser as well as the large.

It first became serious in New England many years ago, and is now found to a greater or less extent wherever turkeys are grown. At the present time this disease is the greatest handicap to the turkey raiser in Nevada. It affects birds of any age, but most often young turkeys between the ages of six weeks and four months.

Types of the Disease. In the acute form the disease runs a course of from three to ten days. In the subacute or chronic form, which more often occurs in the older birds, the disease may run a course of several weeks or months, ending in death or an incomplete recovery.

Cause. The cause is a microorganism of the type known as *protozoa*. This organism is an animal parasite, and is one of the simplest forms of animal life. There have been several different names given it. Probably the one in most common use is that of *coccidium*. This parasite has a very complex life cycle, which will not be taken up in this paper. Its size varies with the several stages of development, as does its shape.

Symptoms. The external symptoms of blackhead in turkeys are not definitely characterized. Recognition of the disease is not always possible from outward appearance. Loss of appetite, diarrhea, and stupor are the symptoms most uniformly observed. In some cases a purple discoloration of the head occurs before death. This, however, cannot be relied upon as a constant symptom, for in many cases of blackhead it is not observed. Affected birds present a decidedly dull sleepy appearance. The feathers appear ruffled, the wings droop, diarrhea is usually present, accompanied by marked weakness. The bird refuses to range with the rest of the flock, and in the acute type these symptoms are manifested from one or two days to a week before death. In the chronic form of the disease the bird presents an appearance of unthriftiness, with no striking indications of illness. They may improve gradually, but more often succumb after several months of chronic illness. The incubation period of the disease as it occurs in various birds in a flock is indefinite, as it is impossible to ascertain the exact time the bird first becomes affected. No doubt development of the disease is very slow in many cases. In fact, when the disease occurs

in the chronic form, it takes several weeks before the vitality of the bird is exhausted. In this form the owner may be unaware of the fact that disease is present in his flock. This chronic type manifests, as outlined above, a line of symptoms very different from the acute type. Both forms of the disease may occur in the same flock at the same time. It is generally conceded that the older birds are more resistant to blackhead than the younger ones. The survivors in a flock affected with blackhead sometimes improve, but complete recovery is not common. In some instances the disease is harbored in the system of apparently healthy birds and does not make its appearance until they have been subjected to unfavorable conditions, such as exposure, overfeeding, close confinement, and other circumstances which debilitate or weaken the birds. In this way, apparently healthy birds may reinfect the premises and expose new birds to the disease.

Organs Affected. The lesions of the disease are usually confined to the cæca (blind guts) and the liver.

Cæca. These are easily found, being two in number, lying parallel to the rear portion of the main bowel, and terminating in a blind end. The lesions are usually found at the blind end of this gut, which is enlarged, the walls are thickened, and the lumen is filled wholly or in part by reddish intestinal contents mixed with a cheesy mass of exfoliated necrotic tissue. In some places the wall of the gut is studded with ulcers of varying sizes. These may completely perforate the intestinal wall, causing death by peritonitis. The coccidia may be demonstrated by making sections or smears from these ulcerating areas and examining them with a microscope.

The Liver. This organ is usually greatly enlarged and studded in a greater or less degree with areas of local necrosis from the size of a pin-point to as large as a dime. These areas have a sharply defined border and are grayish to yellow in color. The larger ones usually have a soft center which is filled with grayish-yellow pus. Some of these diseased areas, especially those upon the surface of the liver, may be somewhat depressed in the center, and upon cutting through them they have a cheesy consistency. As in the case of the cæca, the coccidia can be demonstrated from these lesions by the use of the microscope.

The above-mentioned changes as a rule are found as enumerated in turkeys dead from the disease, but we may have cases where the lesions are chiefly confined to the liver alone, or *vice versa*.

Source and Mode of Infection. It is generally conceded that the infection gains entrance to the body through the digestive tract. The cystic form of the coccidia is believed to be excreted with the fecal matter of the sick bird. In this way the food and drinking water of the flock become infected, and the healthy birds pick up the infection by eating and drinking this contaminated food and water. There have been theories advanced that infection takes place through the egg, but we believe that this has been disproved. It is not known exactly how long the coccidia will live outside the body, but indications seem to point that they are fairly resistant to the elements.

Prevention and Control. The contagious nature of blackhead makes it vitally necessary to employ very prompt measures of isolation and segregation. Sick birds contaminate houses and runways and the imme-

diate removal of the healthy birds to clean quarters is essential. Affected birds should be killed and cremated immediately, as they continue to intensify the existing infection. It is important that healthy birds do not remain in the same house or come in contact with fowls of any age that have access to infected premises. A common mistake in the control of infectious diseases of poultry, as well as other farm animals, is the removal of the sick to isolated quarters, allowing the healthy to remain exposed to the infected premises. The houses, roosting places, and runways should be thoroughly cleansed. First, all litter should be removed and burned; the boards, roosting poles, floor, etc., should be scraped. If a dirt floor, at least six inches of earth should be removed and spread upon some part of the farm which is not accessible to the turkeys. Slacked lime should be scattered thickly over the surface of the ground. The runways, walls, ceilings, and roosts should be thoroughly sprayed or scrubbed with a hot whitewash containing 5 per cent of carbolic acid or some other good disinfectant. The litter and manure should be removed from the roosting place daily and burned, and the spraying repeated for several days; then the clean-up process and spraying should be repeated at least once a week. On farms where poultry ranges are large, this precaution should be taken regularly as a means of warding off infection. All drinking vessels should be thoroughly boiled or scalded daily and so placed that excrement from the birds cannot get into the water. Other fowls, such as chickens and ducks, should not occupy the same roosting houses or feeding pens as turkeys. It is believed by some that chickens may harbor the parasite causing enterohepatitis without becoming sick, and thus transmit the disease to the turkeys. Turkeys, however, aside from the above point, do not thrive when raised in close association with other varieties of poultry. During an outbreak of blackhead the water and food supply of the healthy birds should be controlled as much as possible. They should be forced to a new range, and the water in the drinking vessels placed before them early in the morning so they will drink their fill before going on the range. Occasionally it is possible to limit their water supply by fencing creeks or filling puddles, etc., where there is a possible source of contamination. During an outbreak soft laxative foods should be fed in order that the bowels may be properly functioning, thereby aiding nature in throwing off any infection which might be taken up. Constipation has a tendency to cause inflammatory conditions to exist in the intestines, thereby giving an excellent opportunity for the parasite of blackhead to gain a foothold. In other words, promote the vitality and health of the birds in every way possible—by clean housing, clean water and food, abundant exercise, protection from storms, etc.

In the control of this disease there is as yet no means of vaccination or immunization which will protect birds. We have to depend entirely upon the careful interpretation and carrying out of definite lines of sanitation and segregation as outlined above to prevent its spread from flock to flock and from individual to individual in the same flock. The omission of any one of the precautions may make all the other measures employed worthless.

Medicinal Agents Used. Records of treatment of this disease do not seem to point to any special efficacy of any particular remedy as a specific. What seems to give results in the hands of one investigator

may prove worthless when used by another. The following agents have been used from time to time, and it may be well worth while to try them should the occasion arise:

In Kentucky, sour milk given liberally to the birds showing the chronic form of the disease seemed to prove beneficial in some cases. The treatment should be started early in the course of the disease and the birds should have access to the milk at all times.

In Canada, muriatic acid in the drinking water, in the proportions of one teaspoonful in each quart of water, has proven harmless and sometimes seems to exert a favorable influence upon the course of the disease.

Likewise, permanganate of potash mixed with the water (that amount of the chemical which will lie on a dime, in one gallon of water) seems to exert a more or less favorable action when given early.

Sulphocarbolates Compound Containing Phenol. This treatment was used and thoroughly tested by Mr. L. E. Cline, Agriculturist at the Experimental Farm at Fallon, Nevada, during the summer of 1917. The method of using as given below is that followed by Mr. Cline:

The turkeys were divided into three pens when the disease was first noticed—the strongest and largest birds in the first pen; the second pen contained the next vigorous birds; and the third pen the smallest and weakest birds. Mr. Cline's experience with the sulphocarbolates of zinc, calcium, and sodium was not very encouraging. He then tried the zinc, potassium, and copper phenol sulphonate tablets used in veterinary medicine. The dose advised is two grains of the preparation per pound of live weight twice a day for three days in succession. This was fed in a wet bran mash and was readily eaten. All pens were treated the same. At the first indication of weakness or diarrhea the treatment as enumerated above was repeated. This was required as often as every ten days or two weeks throughout the summer. All three lots of turkeys were confined in pens, and these pens, of course, became badly infected. The stronger birds seemed to resist the disease much better than the weaker ones. After adopting this treatment Mr. Cline states that he had very little loss and was able to carry his turkeys through the season to maturity and have them ready to market at Christmas-time.

Salol and carbolic acid have been used. All of these preparations are what are known as intestinal antiseptics, and any benefit derived from their use is due to their antiseptic action upon the intestinal contents.

Treatment is usually useless in the very sick birds, as the lesions of the disease are so extensive and tissue destruction is so great that a cure is practically impossible, even if the parasite be killed and eliminated.

Disposal of Dead Birds. Birds dead of blackhead, as of all other infectious diseases, should invariably be burned. This is easily accomplished, as the carcasses are small.

Fowl Cholera

This disease attacks practically every species of fowl. It is scientifically known as hemorrhagic septicemia of fowls.

The Causative Agent is a small microorganism known as *bacterium avisepticum*. These germs are found in large numbers in the discharges

of fowls affected with this disease. Food and water becoming contaminated with the droppings of sick birds are sources of danger and cause a rapid spread of the disease.

Symptoms. The disease appears in from three to seven days after infective material (contaminated food) has been taken up, depending upon the individual bird and the amount and virulence of the material ingested. The onset of the disease may be so sudden that among a flock of birds, which showed no symptoms of the disease the night before, several may be found dead under the roosts in the morning. In the subacute cases the bird will first be noticed to have no appetite and will be extremely thirsty, due to a high fever. The bird becomes weak, feathers appear unkempt, the fowl stays by itself, is listless, trembles, reels as it walks, rapidly becomes emaciated; the comb becomes dark and there is often a severe diarrhea soon followed by death.

Post-Mortem Appearance. On examination, a bird dying of the acute type of the disease may reveal no changes discernible to the naked eye. Those having the disease longer before death (subacute or chronic cases) generally show departure from the normal. The liver is apt to be enlarged, pale, brittle, dry, and be thickly set with minute white points. The intestines are congested, contain a frothy material, and some portions may be hemorrhagic. The spleen may be enlarged and soft; the kidneys are sometimes studded with bright red hemorrhages from the size of a pin-point to as large as the head of a pin. The principal change in the thoracic cavity is in the heart, which is usually studded with hemorrhages over the auricles and sometimes over the ventricles.

Treatment. This consists in immediate isolation of sick birds and very thorough cleaning and disinfection of houses, runways, and yards. Cleanliness of food and water should be especially emphasized. In short, the methods as advised in the control of blackhead should be practised.

Prevention. A vaccine has been prepared by the Veterinary Department of the University of Nevada which has given very gratifying results in immunizing fowls against this disease. This vaccine is administered to affected flocks without charge. A sick bird or one which has recently died should always be sent to the laboratory for diagnostic purposes when this disease is suspected.

Epitheliosis

CONTAGIOUS EPITHELIOMA, SWELLED HEAD, ROUP OR FOWL DIPHTHERIA

These diseases are so nearly alike that they may be considered from a practical standpoint under one head.

They are characterized by a more or less chronic course, attacking fowls of any age. The lesions usually are warty growths on the comb, wattles, and ear lobes, swellings below the eyes, formation of false membranes in the throat, and discharge from one or both nostrils. The birds are usually off feed, their breathing is unnatural, their feathers are ruffled, and they do not range, but prefer to remain in one place.

Sanitary precautions as to disposal of dead birds, cleaning of premises, and isolation of affected birds should be strictly observed.

Treatment of individuals, by swabbing the throat with iodine and

opening the swellings under the eye, is satisfactory in some cases, but is hardly practicable for the large poultry raiser.

Immunization with a vaccine prepared from the various organisms found in these cases has been practised by this Department with considerable success. This condition is more fully discussed in Bulletin No. 84, Agricultural Experiment Station, University of Nevada, "Contagious Epithelioma in Chickens; Its Control by Vaccination."

Tuberculosis

Tuberculosis is a specific infectious disease caused by a bacterium known as *bacterium tuberculosis*. The disease shows itself in poultry by the development of yellowish-white nodules. These are principally found in the spleen, liver, wall of the intestines, mesentery, joints—in fact, they may occur in any tissue of the body.

Symptoms are not uniform in all birds. They depend a great deal upon what part of the body is the seat of the disease. A lesion in a joint may produce lameness or the drooping of a wing, etc.

Modes of Infection. The most common source of infection is from sick to healthy fowls. Experimental evidence indicates that fowls may contract the disease by following tubercular cattle or hogs; also by eating the sputum from persons affected with tuberculosis.

Prevention. As medicines have no effect or value in the treatment of this disease, every precaution to safeguard the health of the flock should be taken. The flock should not be allowed to follow cattle or hogs known to be infected with tuberculosis. Eggs for hatching should not be purchased from diseased flocks; likewise, new birds should only be brought in from healthy flocks. In short, the general preventive measures as prescribed for other infectious diseases should be applied.

Eradication. When the disease is present in a flock, the visibly affected should be killed and burned. If only a small flock, it is best to kill all the birds and use for food those individuals showing no lesions, and make a fresh start with new healthy stock after a very vigorous cleaning up of the premises.

This disease is not so prevalent in turkeys as in other species of fowls, owing, perhaps, to their habits of ranging, roosting in the open air, etc.

Botulism

This condition is an intoxication or poisoning due to fowls eating food which contains the toxin eliminated by the growth of *bacillus botulinus*. The most common conditions under which we have observed this trouble have been where food (such as string beans) canned by the cold-pack method has been found not to have kept well, and, not being considered fit for family use, has been thrown to the fowls. In one instance 21 out of 24 birds died in a few hours after eating from a can of spoiled beans.

The fowls manifest various symptoms, the chief of which is the rapidity with which they die.

This trouble is differentiated from a contagious disease by the fact that only the birds which eat the spoiled food are affected. Birds which recover may be paralyzed in certain members, such as the wings, legs, etc., or may hold the head in an unnatural position for some time after the attack has passed.

Treatment has not proven satisfactory, as the course of the disease is so rapid. Prevention consists in not feeding spoiled food to fowls.

Salt Poisoning

During the past few years this department has had occasion to investigate the cause of death in several flocks of poultry which was undoubtedly due to the ingestion of large quantities of common salt. The fowls, as a rule, get access to salt in such amount as to cause their death through carelessness of their owners, as by the dumping of ice-cream freezers in the poultry yard, etc. It is not definitely known how much salt is necessary to kill a fowl, but it seems that it does not require a very large amount. This trouble is wholly preventable, but so far no satisfactory treatment has been devised.

PARASITES

The most important parasites of turkeys are lice. Of these there are three kinds, classified as to genera—*Goniodes*, *Lipeurus*, and *Menopon*.

Of these, the *Goniodes* styliifer is most often encountered. It is a rather large louse, considerably longer than wide, and of a dirty-white color. The next in importance is the *Lipeurus polytrapezius*. This is a smaller louse, and is yellow in color with dark bands around the abdomen. The other variety is the *Menopon biseratum*, or common chicken-louse.

In adult birds the lice are usually found in the fine feathers under the wings and on the abdomen around the vent. In poultz they are most often found upon the head.

Eradication. The method of eradication is relatively simple. It consists in dusting the birds with a good louse-powder, the best of which is *sodium fluorid*. This is applied by what is known as the "pinch method," which consists of placing a pinch of the chemical under each wing, on the breast and in the feathers around the vent. This operation should be repeated at intervals throughout the season, as the eggs of the parasites are not killed by the chemical. Very young poultz need not, as a rule, be dusted, as the application of olive oil, vaseline, or other mild greasy substances to the head is usually sufficient to rid them of the parasites. At the time of treating the fowls the roosts should be thoroughly cleaned and scrubbed with whitewash, kerosene, or some disinfectant, such as sheep-dip.

For further details as to lice and mites, see Farmers' Bulletin No. 801, United States Department of Agriculture.

There are various other diseases and conditions with which the turkey raiser must combat, but we believe that those mentioned in the foregoing pages are the greatest handicaps to the successful progress of the industry in Nevada.

LABORATORY DIAGNOSIS

The State Veterinary Control Service maintains a laboratory for the diagnosis of the infectious diseases of animals and poultry at the University of Nevada, Reno, where examinations are conducted upon specimens submitted for diagnosis, and, in the case of infectious diseases, treatment provided when any satisfactory method of same is available. When sending specimens for diagnosis, best results are

usually obtained by sending one or more live fowls exhibiting typical symptoms of the disorder affecting the flock. When sending a fowl already dead, it is best to place the bird in a can or box, place this in a larger box, and pack in ice. Always ship specimens by express, as dead fowls decompose very rapidly, especially in warm weather. At the time of shipment a letter should be sent, giving complete history of the disease, number of deaths in the flock, and other information which may be of aid in arriving at a diagnosis. It is also well to wire at the time of shipment, so that material may be secured from the express office without delay. Reports will be promptly made by wire or letter upon the completion of the examination.

There is no charge for this service, except in some cases for the vaccines or drugs used, which are supplied at cost.





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**DON'T FEED FOX-TAIL HAY TO
LAMBING EWES!**



By

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Of the Department of Range Management, Agricultural Experiment Station

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Owing to the exhausted condition of many of the winter sheep-ranges in Nevada, and because of the rising value of wool and mutton, it is becoming customary in many parts of the State to bring ewes in to the valley ranches and feed them on hay during the lambing season and for a few weeks later.

A number of the larger sheep-owners and livestock companies have recently made heavy investments in sheds and corrals for lambing under shelter in order to increase the percentage of lambs saved and to put both lambs and ewes upon spring range in the best possible condition.

The feeding of hay to lambing bands has not proven successful, owing to the fact that on hay alone the ewes give very little milk. A study of the problems connected with the early spring feeding of lambing bands was begun in 1919 by the Nevada Agricultural Experiment Station as Project 24, Hatch Fund. In connection with this project an examination of various kinds of local hay fed in the spring of 1919 showed that some of the hay produced in western Nevada not only lacks feeding value, but may prove dangerous to the life of ewes and lambs; and, under certain conditions, may cause heavy losses. These studies were conducted by C. E. Fleming, Head of the Department of Range Management in the Nevada Agricultural Experiment Station; and, because of their importance, are presented in this bulletin.

ACKNOWLEDGMENTS

The Experiment Station takes this means of expressing its sincere thanks to Dr. Robert Dill, Inspector in Charge, State Board of Sheep Commissioners, for assistance in the study of squirrel-tail injuries to sheep. Dr. Dill visited the bands where deaths were occurring, and showed that the losses had been unnecessarily increased by the manner in which the hay was fed.

Dr. Edward Records, Head of the State Veterinary Control Service, and Head of the Department of Veterinary Science in the Experiment Station, made post-mortem examinations and dissections in a number of cases. He also visited corrals where the sheep were dying, and examined both dead and living sheep. He was assisted by Dr. L. H. Wright of the Experiment Station, and Dr. R. C. Louck, Pathologist, State Veterinary Control Service.

Drs. Records, Wright, and Louck felt that it would be unwise to conclude that all the deaths among the sheep fed on squirrel-tail hay were due to this noxious grass, because losses in lambing bands occur

normally from a variety of other causes, some of which were observed in the cases studied.

On the whole, however, there seemed to be abundant evidence that a very large part of the deaths, amounting in one band to several hundred ewes and lambs, were caused by this grass. In the fatal cases the grass blinded the ewes or made their mouths so sore that they either died of starvation or else fell easy victims to common diseases.

S. B. DOTEN,

Director Nevada Agricultural Experiment Station.

DON'T FEED FOX-TAIL HAY TO LAMBING EWES!

This bulletin presents the results of observations upon the injurious effects of feeding ewes during the lambing season on hay containing quantities of squirrel-tail grass (*Hordeum jubatum*, squirrel-tail, tickle grass, fox-tail grass). Humane considerations, as well as self-interest, should forbid the use of hay in which it makes up any large part of the bulk. This grass is worth little for grazing; and when put up in hay it is dangerous. Fields and meadows on which it grows would be improved by its destruction. No other weed concerns the users and producers of hay for sheep feeding so much as squirrel-tail grass. It is dangerous as soon as it heads; when dried and fed in considerable quantities it becomes obnoxious and destructive.

Common Names:

This grass is usually spoken of by any one of four common names: squirrel-tail grass, fox-tail grass, tickle grass, and wild barley. The name squirrel-tail grass is probably more generally used than any of the other three. However, in the Rocky Mountain region it is very frequently called either fox-tail grass or tickle grass. These names have come into general use because (1) "squirrel-tail," "fox-tail" and "wild barley" clearly describe the appearance of the seed head, and (2) "tickle grass" describes the irritating sensation produced when the beards rub against the skin. It is because of these awns (beards) that this grass may fairly be called one of our worst pests, not only because they are directly or indirectly responsible for loss of condition and death of sheep, but also because of the pain and suffering produced when fed in hay.

Description:

Squirrel-tail grass is a perennial, coming up each year from the same mass of roots; thus it is not dependent upon its yearly crop of seeds for its perpetuation. It develops a strong fibrous mat of little roots, from which arises a single compact bunch of leaves and stems. The size of the bunch depends on the age of the grass, for it becomes constantly larger as the plant grows older until it is from 6 to 10 inches across. Squirrel-tail grass is a coarse ragged grass from 6 to 24 inches high, according to soil and moisture conditions. It bears numerous slender flat leaves which are much paler when young than the leaves of the common blue-grass. The seeds are borne in a dense spike (seed head) from 2 to 4 inches long, purplish in color at first, or pale green, but later turning to a greenish straw color. Figure 1 shows the general shape of the seed head, which may be described as consisting of a large number of one-seeded spikelets which, when mature, break up into joints consisting of one perfect flower or seed and two rudimentary spikelets all bearing awns (beards), a total of seven in number.

The number of seeds in a head varies from 30 to 60, with an average of approximately 40 seeds to the head. A plant four inches across the crown will produce about fifty heads to the plant with a total of approximately 2,000 seeds or 14,000 awns per plant. At this rate an



Figure 1. "Squirrel-tail" with Bearded (Awned) Seeds.

acre of ground with one plant growing on every square foot would produce nearly 90,000,000 seeds and more than 600,000,000 awns. With the production of so many millions of seeds and barbed awns capable of attaching themselves to the skin and wool of sheep, the plant is admirably adapted for rapid and widespread distribution.

Distribution:

This grass is now widely and abundantly distributed across North America. Formerly it was confined almost entirely to the Rocky Mountain region, where it grows around the borders of ponds, in swampy alkaline flats, along streams and irrigation ditches, and in meadows and fields wet from overirrigation or seepage.

Today it is widely and abundantly distributed in Nevada. In many places it is becoming a serious menace on land which is used for the production of hay. On every piece of hay land where it has become established it is a troublesome weed which materially reduces the feeding value and the sale price of the hay.

Wind and irrigation water are the two chief means of distribution, although undoubtedly it is often carried long distances in the wool of sheep. It grows not only at the lower altitudes, but often in the mountains as high as 8,000 or 9,000 feet.

Means of Control:

Because of the fact that squirrel-tail grass is not an annual, it cannot be completely controlled or eradicated by early cutting or frequent clipping, the purpose of which would be to prevent it from going to seed. There seems to be a widespread belief that this grass depends for its perpetuation upon its annual crop of seeds. This is a mistake, for it is a perennial, living from year to year upon the same root stem.

Carried everywhere by wind, water, and grazing animals, it spreads to all hay lands and becomes established if conditions are favorable, growing best in low and wet spots. Often in the spring and early summer the better native and cultivated grasses are partially killed out by an excess of water and are permanently replaced by squirrel-tail. This is apt to occur if water is allowed to stand on hay fields during winter and spring, or if the fields are constantly overirrigated.

On a piece of land where squirrel-tail has become abundant, complete success has been obtained in getting rid of it by plowing the ground deeply and seeding down to a crop of oats and peas, after which the ground was reseeded and sown to alfalfa. When it becomes established in considerable quantity in any field, it is quite a sure indication that the better forage plants have been run out by too much water. It is then best and safest to break up the land, level it, and plant to a cultivated crop for a year or so. If this is not practicable, the land should be plowed deeply and resown; no more water should then be applied than the crop needs for good growth.

This grass commences to grow very early in the spring and is usually from two weeks to a month ahead of the other forage plants with which it is associated. Consequently it is ready to head out much earlier than the others, or about June 1 at Reno. Thus, when the hay crop is ready to cut, the "squirrel-tails" have already been produced; and the hay cannot be harvested without containing masses of the injurious awns. A practical means of preventing losses from squirrel-

tail grass on hay lands is to graze with sheep early in the spring when the grass is high enough to be tempting and palatable. This early and severe grazing has two distinct beneficial results: (1) it reduces the vitality of the squirrel-tail grass, and (2) it gives the other grasses an even chance to grow; for by the time the sheep are removed the squirrel-tail grass is closely cropped to the ground. The hay is harvested just at the time the heads of the squirrel-tail grass are beginning to appear. The above method of decreasing the injurious effects of squirrel-tail grass in infested fields has been tried out and practised



Figure 2. Squirrel-tail Grass in Hay.

by Walts Brothers on their ranch near Reno, and the hay has been fed without harmful effects.

Cause of Injury when Fed to Live Stock:

Figure 2 shows a small bunch of hay containing the heads of squirrel-tail grass.

Part of a single awn (beard) of this grass is shown in Figure 4. The awn bristles with small barbs with reinforced bases and extremely sharp cutting points. These barbs all point backward, so that when the awns become attached or lodged in the tissues or skin they continue to travel in one direction only, the pointed barbs preventing them from loosening up and coming out.

Mechanical Injuries Caused:

The awns most often infest the delicate tissues in the region of the eye, the membranes of the mouth, the sides of the jaw, or the wool



Figure 3. Bunch of Squirrel-Tail Grass.
(Fox-tail, Tickle grass, *Hordeum jubatum*.)

of the head, neck, and back. As soon as they become lodged, they begin to work into the flesh, causing injuries which affect the condition of the animal and frequently lead to very serious consequences or death.

In the examination of heads of sheep the following types of injury were observed: (1) Some awns found in the ears, where they caused abscesses, due to mechanical injury and subsequent infection by bacteria; or (2) in the mucous membranes of the upper and lower eyelids, causing inflammation with a discharge of a yellowish-white opaque creamy pus. (3) They were commonly found between the eyeball and the tissues of the orbit, causing semi- or total blindness. (4) Many awns had penetrated the skin of the head between the nose and the forehead or on the cheek and around the eye, causing the wool and



Figure 4.
Part of
Single Awn
(Beard).
Magnified (X100.)

hair to slough off with the formation of pustules, or small abscesses. (5) They had become imbedded in the lips, causing redness and swelling, with a formation of small pimple-like elevations filled with pus. (6) Awns were common on all surfaces of the tongue; and (7) in the openings of the glands secreting into the mouth. (8) Others had penetrated into the nasal passages, causing extreme irritation. (9) In nearly all heads examined, masses of awns were embedded in the gums beside the molars of both upper and lower jaws. (10) They had worked in around the incisors and caused them to loosen in their sockets and fall out. The gums had shrunk away from the teeth and in many cases there was ulceration and decay. In other instances they were embedded in the palate. (11) Many were found in the soft tissues under the tongue.

The following examinations were made of heads selected at random on March 14, 1919, from a pile of over 300 carcasses of ewes that had been feeding on hay containing a high percentage of squirrel-tail grass. The hay consisted mainly of timothy and meadow grasses and a small amount of alfalfa:

Case No. 1: Awns were found in the lower molars, the front teeth had dropped out, and awns had penetrated the cavities in which the teeth had been. Awns were also found around the eyes and in the sublachrymal pits.

Case No. 2: Awns were found alongside and between the teeth of the upper and lower molars and in the sublachrymal pits.

Case No. 3: A few awns were found lodged in the outer opening of the ear (external auditory meatus).

Case No. 4: Awns were found alongside and between the front teeth and lower and upper molars. The lower jaw was ulcerated on both sides, due to the awns penetrating down to the sockets of the molars.

Case No. 5: Awns were found between and alongside all of the front teeth and also the upper molars. The lower jaw was slightly ulcerated in the region of the molars. Awns were present under the tongue, in one eye and in the sublachrymal pits.

Case No. 6: Awns were found around the front teeth and had penetrated the gums of the lower molars and the membranes under the tongue. A bunch of awns about three inches up in the nasal cavity was also found.

Case No. 7: Awns had penetrated the gums of the front teeth and also the lower molars, and the membranes under the tongue. Several awns had worked into the inner surface of the cheek. The sublachrymal pits also contained many awns.

Case No. 8: Both eyes and both sublachrymal pits were invaded by awns and they were also present around the

front teeth and around and between the upper and lower molars. Some had penetrated the palate and large numbers were found in the tissues under the tongue. A few were present in the nasal cavity.



Figure 5. Eye Blinded by Awns. Upper Lip Out Away to Show Mass of Awns Between Teeth and Lip.



**Figure 6. Awns Embedded in the Angle of the Lower Jaw:
Pus Exuding.**

Case No. 9: Awns were found around the front teeth and around and between both the upper and lower molars. Both eyes were affected.

Case No. 10: Both eyes were badly injured by awns and they were also present in the sublachrymal pit, around the front teeth, around and between the upper and lower molars and in the tissues under the tongue.

Case No. 11: Awns were found around the front teeth, between and around the upper and lower molars, in the gums immediately back of the front teeth, in both eyes, and in both sublachrymal pits.

Case No. 12: Awns were found in the gums of the front teeth, the upper and lower molars, in the upper and lower lips, in the palate and in the back part of the nasal passage. The upper jawbone was ulcerated and the gums were badly affected. Awns were also present in both eyes, under the tongue, in the upper surface of the tongue, and in both sublachrymal pits.

Case No. 13: The molars of both jaws were infested with awns, and the lower jaw was ulcerated on one side. The upper lip, both eyes, and both sublachrymal pits were badly affected.

Case No. 14: Awns had penetrated the gums of the front teeth. Others were found in the gums of the upper and lower molars, in the outer opening of the ear, in both eyes, in both sublachrymal pits. Both the upper and lower jaws were ulcerated.

Case No. 15: The front teeth had become loosened and had fallen out, the gums were badly affected, the gums and sockets of both upper and lower molars were freely penetrated with awns; many awns had pierced the soft palate and become lodged. Awns had penetrated the Eustachian tubes, the upper lip, the nasal passages, both eyes, both ears and both sublachrymal pits.

Case No. 16: The sockets of the front teeth, the upper and lower molars, and the lips were full of awns. Many awns were found lodged on both sides of the tongue and under it, in both eyes, both sublachrymal pits and the ears.

Case No. 17: The front teeth had become loosened and had fallen out; the sockets of the upper and lower molars were freely penetrated with awns. One upper molar had become loosened, and many awns and other material had become lodged in the gums to an extent which had made feeding extremely difficult. Both eyes were also badly affected.

Case No. 18: Awns had penetrated and had become lodged in the gums of the front teeth, around both the upper and lower molars, in one eye and in both sublachrymal pits.

Case No. 19: The gums and sockets of the front teeth and the upper and lower molars had become freely penetrated with awns, especially one of the lower molars. Awns were also found lodged under the tongue, in the lower lip, in both eyes, and in both sublachrymal pits.

Case No. 20: The gums of the front teeth and the upper and lower molars had many awns lodged in them, and there was a severe infection under the tongue. In the orbits of both eyes and in the sublachrymal pits many awns had become embedded.

Case No. 21: The front teeth were locally infested with awns in the gums of front and rear sides of the incisors. Both upper and lower

molars were infested on both sides, with many awns in the inner surface of the cheek, in the openings of ducts beneath the tongue, and in the sides of the jaw. Some had penetrated the jaws, others were found in the orbit of one eye, and in one sublachrymal pit. One large awn had entered the nasal cavity and lay in a mass of pus.

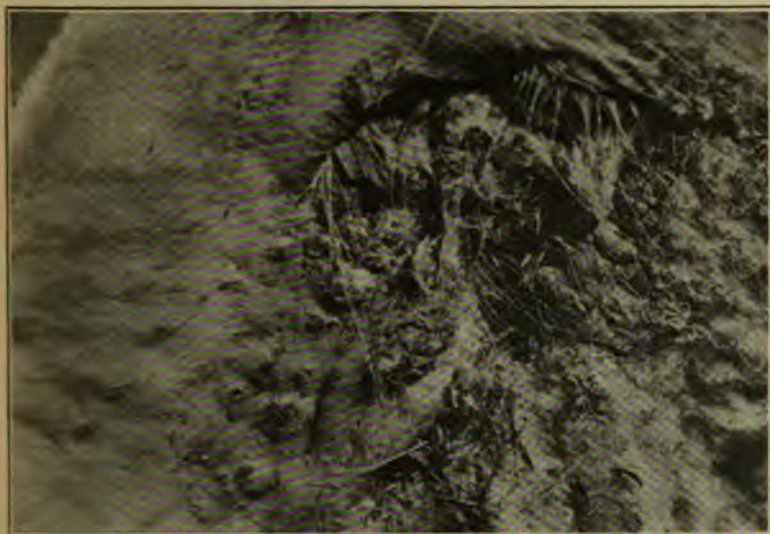


Figure 7. Bearded Seeds of Squirrel-tail Grass in Blinded Eye of Sheep.
Abscesses on Face from Same Cause.



Figure 8. Lamb Blinded by Awns of Squirrel-tail Grass.
Note Abscesses on Face.

SUMMARY OF EXAMINATIONS OF TWENTY-ONE HEADS SELECTED AT RANDOM FROM A LARGE PILE OF SHEEP CARCASSES
 Check x indicates the organ was found to be infested with awns.

Sheep No.....	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	Total
Eye.....	x				x			x	x	x	x		x	x	x	x	x	x	x	x	x	15
Sublachrymal pit.....	x	x			x			x	x	x	x			x	x	x	x	x	x	x	x	16
Front teeth.....	x			x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	16
Upper molars.....		x		x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	18
Lower molars.....	x	x		x	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	19
Palate.....																						5
Gums.....																						3
Under tongue.....																						9
Upper lips.....										x					x	x			x	x		4
Lower lips.....															x	x						4
Inner surface of cheek.....																						1
Surface of tongue.....							x															2
Ear.....			x																		x	6
Nasal passage.....																x						5
Eustachian tube.....																					x	1
Upper jaw ulcerated.....																						2
Lower jaw ulcerated.....				x	x																	4

The foregoing twenty-one examinations were made from the heads of range sheep which had been brought in to be fed hay during the lambing season. The ewes were grade Rambouillet and, while they were not young, most of them originally had fairly good teeth.

The hay contained a large percentage of squirrel-tail grass. It was fed in feed racks that did not permit of the ewes getting the hay with any degree of ease. Some fed standing on their hind legs, while others had their heads half buried in the hay. Because of these feed racks, the ewes were infested with more of the awns than they ordinarily would have been if the hay had been scattered on the ground or fed in racks in which the hay would have been more accessible.

Relation of Age to Injury:

It was noticed that the sheep which were suffering most from squirrel-tail injuries were the yearling lambs and the aged ewes,



Figure 9. A Triple Loss.

although there was general infestation of all ages. Possibly the young sheep were more heavily infested because their bodies are nearer the ground and their skin more tender. Of course, the old ewes are injured most because (1) they have not the vitality of the younger and middle-aged sheep, and (2) their teeth are usually broken or lost or spread so that the awns become readily lodged, causing serious mouth trouble, with the result that the ewe is either very reluctant to eat or entirely refuses to eat, and soon is found standing apart from other animals in the flock slowly dying of starvation.

Relation of Breed to Injury:

Merino and Rambouillet sheep are injured more than the more open-wooled and smooth-bodied breeds. The fine wool of the Merino holds the awns more tenaciously than other types of wool. Sheep with open wool and clean faces are not so seriously injured as are the sheep of

Merino breeding, which have considerable wool about the eyes. The Merinos gather more awns because of the wrinkles around the neck and head.

Economic Loss:

When the wool of the back, neck and flanks is full of the pricking bearded seeds, the sheep walk stiffly; every motion hurts as if the skin were full of slivers. The natural easy gait is gone, and, instead, the bodily movements are constrained and stiff. This is all due to the pain produced by the piercing awns and the thick mass of seeds embedded in the wool and skin. Eventually the skin loses its pliability and becomes hard, and the wool feels rough and dry on being handled. The sheep stretches, rubs itself, bites the wool. It may become so badly infested that the masses of bearded seeds will give all the wool a brownish color. Naturally, as a result, the sheep loses flesh and the wool is materially damaged. The animal refuses to eat and dies of starvation or becomes so weakened as to die from any disease to which it may be



Figure 10. Saving the Hides.

subject. When the ewe is blinded by the awns or when her mouth is extremely sore and tender, she ceases to feed and may die of blood poisoning, of starvation, or of any disease to which she is subject.

Mortality:

The loss to the owner because of awn infestation is greater than the actual loss by deaths. This is due to the fact that (1) the wool depreciates very materially in sale value; (2) the loss of condition not only affects the ewe but the subsequent growth of her lamb, and (3) she gives little or no milk. (4) The useful life of the ewe is shortened materially by loss of condition, loss of teeth, etc., which makes her prematurely an old ewe so far as her worth on the range is concerned.

The actual deaths vary in different bands, due to a difference in the breed, age, and manner of feeding. However, the death of the ewe at lambing-time usually means the death of the lamb, so the loss is doubly serious at this period of the year. Unless preventive measures are taken, the mortality is high, even from a short feeding season on hay containing a considerable percentage of squirrel-tail grass.

Especially Injurious During Lambing Season:

The lambing season is the most trying part of the year to the ewe. This is especially true if she has twin lambs. It is a time of the year when she needs comfort, kind attention and an abundance of milk-producing feeds, otherwise the loss of ewes and lambs is bound to be high. Even under the best of conditions, where several thousand ewes are lambing, the number of doubtful lambs runs from 1 to 3 per cent, depending upon the character of the feed, the age of the ewes, and the skill and experience of the lambing crew. By a doubtful lamb is meant one that requires more or less individual attention in order to save and



Figure 11. Sheep Eating Squirrel-tail Hay from Feed Rack. The head is half buried in the hay. This method of feeding is sure to cause losses.

rear it. If the lambing conditions are not quite right, the number of doubtfuls may run into a horde. In order to reduce losses to the smallest possible point, the sheepman should keep three things in mind when he brings ewes in from the range, and puts them into the lambing corrals. These three points are (1) to give hay and other feeds that will make the most milk; (2) to make the lambing results more certain by insuring against possible heavy loss due to starvation and severe storms, and (3) to eliminate, so far as practicable, the small but regular losses due to "outlaw" ewes, poor weak ewes, weak lambs, twin lambs, predatory animals, rough handling, lack of attention, and insufficient help. However, even if all the conditions are ideal, if the

hay contains squirrel-tail awns in any large quantity, large losses of ewes and lambs may be expected with always a very high percentage of lambs in the doubtful list.

Kleinheinz in his book on "Sheep Management" says: "Timothy and marsh hay should at no time be offered as feed to sheep. Too much emphasis cannot be placed upon this statement, for timothy hay with its coarseness and woodiness has caused the loss of thousands of sheep annually in this country from constipation." This statement is verified by many western sheepmen who have had large losses from feeding a straight diet of timothy and marsh hays. A few of them firmly believe, although erroneously, that timothy hay when fed for a prolonged period contains sufficient poison to kill sheep.

Squirrel-tail grass, when put up in hay, is usually associated with timothy and marsh grasses and grasslike plants, and it is little wonder



Figure 12. Bearded Seeds of Squirrel-tail Grass in Back of Sheep.

that large and abnormal losses occur when such a combination of feeds may form in many cases the sole diet of the ewe and her lamb.

Feeding Squirrel-tail Grass in Hay:

If one is compelled to feed squirrel-tail grass to sheep, it should never be fed in feed racks. It is far better to scatter the hay thinly over the ground, for this will give the sheep the greatest freedom in the selection of what they eat, and they will, as a result, reject and refuse to a large degree the heads of the squirrel-tail grass. Further, this manner of feeding largely prevents the awns from infesting the external part of the body. Injurious results can be prevented to some extent by casting aside at the time of loading all hay in which the squirrel-tail grass makes up the greater part of the bulk, as it so frequently does in various parts of the hay in the stack.



CARSON CITY, NEVADA

STATE PRINTING OFFICE . . . JOE FARNSWORTH, SUPERINTENDENT
1919

BEFORE THE PUBLIC SERVICE COMMISSION OF NEVADA

THE WESTERN UNION TELEGRAPH COMPANY, THE
POSTAL TELEGRAPH-CABLE COMPANY, THE BELL
TELEPHONE COMPANY OF NEVADA, AND ALL OTHER
INTERESTED TELEPHONE AND TELEGRAPH COM-
PANIES, IN THE MATTER OF INCREASED RATES.

CASE No. C-532

NOTICE AND CITATION

IT APPEARING That applications by the Western Union Telegraph Company, the Bell Telephone Company of Nevada, and various other telephone and telegraph companies have been made to this Commission for the continuation of war rates as finally increased 20 per cent on April 1, 1919, and which have been filed with the Commission by the Postmaster-General from time to time for and on behalf of all telephone and telegraph companies operating within Nevada during the period of federal control and operation;

IT FURTHER APPEARING That, by Act of Congress approved by the President July 11, 1919, said telephone and telegraph companies have been released from federal control and operation and returned to private operation, with the proviso, however, "that the existing toll and exchange telephone rates, as established or approved by the Postmaster-General on or prior to June 6, 1919, shall continue in force for a period not to exceed four months after this Act takes effect, unless sooner modified or changed by the public authorities, state, municipal, or otherwise, having control or jurisdiction of tolls, charges and rates, or by contract, or by voluntary reduction";

IT FURTHER APPEARING That there is at this time presented for investigation and determination the applications of various telegraph and telephone companies for authority to continue these increased charges, including the question of the reasonableness of telephone and telegraph rates, services and practices for the future;

IT FURTHER APPEARING That, because of the increased cost of labor, materials and supplies urged in support of said increased rates by the Western Union Telegraph Company and the Bell Telephone Company of Nevada on the one hand, and, on the other hand, the fact that, notwithstanding these elements, the Postal Telegraph-Cable Company has voluntarily reduced its rates 20 per cent to the prewar basis, manifestly there is a condition presented which justifies hearing and investigation, before the Commission can intelligently pass upon what are just and reasonable rates to be charged for the future. Without waiver of any right of the State to require the reestablishment of pre-

war rates, services and practices, and subject to certain qualifications and exceptions specifically provided for hereinafter, it is, therefore,

ORDERED, That the rates and charges of the aforesaid telephone and telegraph companies are hereby temporarily authorized as the lawful charges for service within Nevada, pending, full investigation and determination of the reasonableness of the rates for said service for the future. It is further

ORDERED, That all rules, regulations, services and practices heretofore promulgated and approved by the Railroad and Public Service Commission of Nevada be reestablished, effective August 1, 1919. It is further

ORDERED, That all lawfully published rates covering press and other specific services throughout the State which, under federal control, may have been withdrawn, be reestablished, effective August 1, 1919. It is further

ORDERED, That the charges prescribed for installation of telephones be forthwith canceled and withdrawn, and that, in lieu thereof, the Commission's regularly authorized guarantee service charges providing for the payment of two months' rental in advance be reestablished, effective August 1, 1919. It is further

ORDERED, That copy of Western Union Telegraph Company's complaint be served upon the Postal Telegraph-Cable Company for answer by properly accredited representative at the hearing before the Commission; this, for reason that the Postal Telegraph-Cable Company has reduced its rates to the basis of those in effect prior to federal operation and control, and because the Western Union Telegraph Company, in effect, pleads that its service is more costly and expensive than that which is rendered by said Postal Telegraph-Cable Company. In this behalf, the Commission is interested in developing by satisfactory testimony to what extent there may be an offset in the cost of Western Union Telegraph Company's operation because of the highly advantageous joint operating contracts which it has negotiated with practically all the railroads of the country, by which expenses for telegraph operators, offices, heat, light and water are taken care of, in large part, by the railroads; as compared with the expenses incurred by the Postal Telegraph-Cable Company, which does not enjoy these advantages. It is further

ORDERED, That the higher toll rates of the Bell Telephone Company of Nevada from station to station, compared with those maintained by the Postal Telegraph-Cable Company, be investigated. It is further

ORDERED, That all telephone and telegraph companies shall place before the Commission, at the hearing hereinafter set, the actual original cost investment of constructing or acquiring the property for each individual system as a whole, and for that portion thereof which is devoted to, or situated within, Nevada. Further, in this behalf, there must be shown before the Commission the fair present value of the property beneficially devoted to and situated within Nevada at the present time, taken on the basis of fair average unit prices over the past ten-year period, and after allowing for obsolescence and accrued depreciation. It is further

ORDERED, That there shall be shown before the Commission at said hearing a division of the aforesaid property and its fair present value, based upon the traffic of previous representative months or years, which said properties have been handling. In other words, the division in question shall be made in the ratio of which the traffic of a given sub-division bears to the total traffic, and this shall be classified and subdivided under the following heads:

System as a whole.

Transstate—Passing entirely across the State.

Interstate—From without to within, and from within to without the State.

Intrastate—Local, between points within the State. It is further

ORDERED, That the annual gross earnings, operating expenses, and taxes covering the past ten years be shown before the Commission at said hearing; also that an actual or fair estimate of same, covering representative months or years, which is expressive of conditions past, present, and future, be segregated and shown under the heads, respectively, of system as a whole, transstate, interstate, and intrastate business. It is further

ORDERED, That these cases be set down for hearing to take place before this Commission in Carson City, Nevada, on August 29, 1919; and it is further

ORDERED, That copies of this notice and citation be served upon the said Western Union Telegraph Company, Postal Telegraph-Cable Company, Bell Telephone Company of Nevada, and upon all other telegraph and telephone companies operating within the State of Nevada.

BY THE COMMISSION,

E. H. WALKER, *Secretary*.

August 4, 1919.

The issues upon which the foregoing citation is predicated are made clear by reference to the following application of the Western Union Telegraph Company and the answer of the Postal Telegraph-Cable Company:

**BEFORE THE PUBLIC SERVICE COMMISSION
OF THE
STATE OF NEVADA**

In the Matter of the Application of The Western Union Telegraph Company (a Corporation), for an Order Permitting Said Corporation to Continue its Present Telegraph Rates within the State of Nevada.

No. C-532

APPLICATION

The petition of The Western Union Telegraph Company respectfully shows: By virtue of an Act of Congress recently passed, the control of the Postmaster-General over the telegraph system of The Western Union Telegraph Company will cease July 31, 1919, and, effective August 1, the operations

of the company's system will revert back to The Western Union Telegraph Company.

On March 20, 1919, the Postmaster-General, then being in control of the telegraph systems, made the following order:

The following schedule of domestic commercial telegraph rates shall be effective from April 1, 1919, and continue until otherwise ordered:

25-2.....	30-2.5
30-2.....	36-2.5
35-2.....	42-2.5
40-3.....	48-3.5
50-3.....	60-3.5
60-4.....	72-5
75-5.....	90-6
100-7.....	120-8.5

Day letters and night letters shall be computed as at present, but charged for on the basis of the above rates. Night messages will be charged for at an increase of 20 per centum over existing night-message rates. Commercial and Government leased wires shall be charged for at an advance of 20 per centum over existing leased wire rates, whether such wires be furnished by a telegraph or a telephone system under Government control. The telegraph rates for domestic United States Government telegrams are increased 20 per centum over the present Government rates. The rate increases herein ordered are made necessary to meet increased cost of operation occasioned by wage increases now in effect made during the past year and are barely sufficient for the purpose.

Telegraph rates in accordance with the above order became effective April 1, 1919, the rates (in cents) for the various classes of services being as follows:

Where full telegram rate prior to April 1, 1919, was:		Rates (in cents) effective April 1, 1919, are:							
		Full-rate telegrams		Night messages		Night letters		Day letters	
For 10 words or less.....	For each additional word.....	For 10 words or less.....	For each additional word.....	For 10 words or less.....	For each additional word.....	For 50 words or less.....	For each additional 10 words or fraction.....	For 50 words or less.....	For each additional 10 words or fraction.....
20	1	24	1	24	1	24	4.8	36	7.2
25	2	30	2.5	24	1.2	30	6	45	9
30	3	36	2.5	30	1.2	37	7.2	54	10.8
35	2	42	2.5	30	1.2	42	8.4	63	12.6
40	3	48	3.5	36	1.2	48	9.6	72	14.4
50	3	60	3.5	42	1.2	60	12	90	18
60	4	72	5	48	1.2	72	14.4	108	21.6
75	5	90	6	54	2.4	90	18	135	27
100	7	120	8.5	60	2.4	120	24	180	36

The reasons which made an increase in the then existing telegraph rates imperative are indicated in a general way in the order of the Postmaster-General. The situation there depicted has not changed in any way, but on the contrary, provision for higher operating costs must be made as set forth in the accompanying memorandum.

For the reasons stated it is the desire of this company to continue the above schedule of rates in effect between points in the State of Nevada, and The

Western Union Telegraph Company hereby applies to your honorable body for leave to continue such rates in effect, and for permission to continue such rates pending final determination of this application.

Respectfully submitted,

THE WESTERN UNION TELEGRAPH COMPANY,
By A. H. MAY,

District Commercial Superintendent.

Dated at San Francisco, Cal., July 28, 1919.

MEMORANDUM

WESTERN UNION TELEGRAPH RATES

On April 1, 1919, the Government increased telegraph rates by 20 per cent.

So long as the reasons which led the Government to make these increases prevail no reduction in rates can be made if adequate service is to be provided and justice done to the employees.

In announcing such increases the Government said:

The increase of 20 per cent in telegraph rates should be considered in comparison with the 100 per cent in other prices. The purpose is to make the lowest rate that will maintain the service required by the public.

WESTERN UNION SERVICE NATIONAL

Western Union service is national in its scope.

It is the only telegraph service that is country-wide.

The Western Union supplies about 85 per cent of the telegraph service of the United States.

Western Union wires reach 25,500 offices located in 22,525 separate communities. The only other telegraph system reaches but 1,688 communities, or 7 per cent of the total.

The profitable telegraph business is between large communities.

In other words, the Western Union, while supporting offices in about 22,500 communities, obtains over 90 per cent of its gross earnings from about 2,500 communities.

Of some 20,000 communities, the telegraph offices in which are not in themselves sustaining, practically none is reached by other telegraph wires than those of the Western Union.

Receipts from these small offices at railroad stations average about \$20 a month each, and aggregate less than 10 per cent of the company's telegraph revenue. Yet these offices are an essential part of a national telegraph system.

PUBLIC INTEREST REQUIRES A NATION-WIDE SERVICE

The American people have always recognized that public interest requires the maintenance of a large number of postoffices not in themselves remunerative in order that the postoffice may serve the Nation as a whole.

The policy of The Western Union Telegraph Company also is to provide a national service. The fundamental point was clearly indicated in the following Government statement:

A telegraph service might be maintained within certain limited fields where the cost of operation is light in comparison with the volume of concentrated business, at a considerably less rate than is necessary to cover a service extensive enough to meet the public needs.

If the telegraph rates were made sufficient to meet only the cost of operations covering one-sixth of all the service of the country so arranged as to tap only the most profitable business, much of the telegraph service for all of the rest of the country would be destroyed. This would be advantageous to those who luxuriated in the cream of business, but would be disastrous to the public.



WHAT ANY OTHER POLICY WOULD MEAN TO THIS COUNTRY

Testifying before the Interstate Commerce Committee of the House of Representatives on June 5, 1919, Hon. John C. Koons, First Assistant Postmaster-General of the United States, said:

There is no question but that one company can start in the telegraph business and by tapping only the larger places and avoiding unprofitable business do a business 20 to 25 per cent cheaper than the other.

It would be the same as if one man started a postoffice system in opposition to the present one, and handled only first-class mail and only reached the big offices.

If he handled only first-class mail he could handle it at 50 per cent less than his competitor and make millions, but there would be no service to the smaller communities or no second, third, or fourth classes of mail handled.

HIGHER WAGES

The needs of Western Union employees for higher wages are recognized, not alone to meet living costs but that the quality of the telegraph service may be maintained through a proper *esprit de corps*. The wages of labor represent 66 per cent of the total cost of providing telegraph service. Good service can be given only if employees are satisfied; hence any rate policy is unsound which does not permit generous recognition of their work. Western Union employees work eight hours in modern and sanitary offices, and have sickness and accident benefits, pensions, life insurance, vacations with pay, and other advantages. Nevertheless, the telegraph employee has been and still is a modestly paid individual.

NO PROSPECT OF REDUCED COST

In again assuming conduct of its operations the Western Union management must have regard for present as well as future operating costs. As it was so clearly and forcibly pointed out before a House of Representatives Committee by Interstate Commerce Commissioner E. E. Clark on July 17, *yet higher operating costs are certain and there is no prospect of reduced wages.*

Prudently managed public utility companies must provide for higher costs in practically every direction for a more or less indefinite period. No schedule of rates which disregards these facts is or can be in the interest of the public.

DISPOSITION OF WESTERN UNION EARNINGS

The Western Union Telegraph Company has issued no new securities since 1900. The dividend rate since 1908 to date has averaged 4.4 per cent. For the year 1917 and subsequently under the Government guarantee, the company has paid dividends at the rate of 7 per cent per annum.

To summarize:

1. Present rates are necessary to maintain a national service.
2. A national service includes provision for 20,000 unprofitable offices, as well as the self-sustaining and profitable offices in 2,500 communities.
3. If the Western Union restricted its business to those communities between which service is profitable, some 20,000 places, now a part of a national system, would have no telegraph service whatever.
4. The necessity for meeting higher cost of wages, material, taxes, and expenses of every kind requires maintenance of the existing schedule of rates.
5. Public interest demands that rates shall be charged which will encourage rather than hamper efficiency and excellence of service.

THE WESTERN UNION TELEGRAPH COMPANY.

POSTAL TELEGRAPH-CABLE COMPANY

EXECUTIVE OFFICES

253 Broadway
NEW YORK, August 21, 1919.

Public Service Commission of Nevada, Carson City, Nevada.

DEAR SIRS: We have duly received your inquiry of August 4 relative to the claim of the Western Union Telegraph Company that its service is more costly than ours and hence that it should be allowed to continue the 20 per cent increase in telegraph rates inaugurated by Postmaster-General Burleson on April 1, 1919, and still continued by the Western Union Telegraph Company, although that 20 per cent was eliminated by the Postal Telegraph-Cable Company on August 1, 1919, and is no longer charged by our company in the transmission of telegrams throughout the country.

In our opinion there was absolutely no justification for increased telegraph rates on April 1, 1919. The telegraph companies were operating profitably under the schedule of rates then in force. The telegraph lines were taken over by the Government as a war measure, and on April 1, 1919, there was no longer any need for the Government to exercise supervision over them, inasmuch as the war had come to an end by the signing of the armistice on November 11, 1918. The representatives of the Postmaster-General approached the operating officials of the Postal Telegraph-Cable Company with a view to telegraph rates being raised voluntarily prior to April 1, 1919, but we refused to do so, and so Mr. Burleson removed us from office and a week later ordered this increase of 20 per cent in telegraph rates. At the same time he put in charge of the Postal Telegraph System a man affiliated with the Bell Telephone Company to enforce the collection of these increased rates. Immediately an effort was made to increase the operating expense of the Postal Telegraph System with a view to rendering it impossible for us to reduce the rate when the properties came back to us. Over a million dollars per annum were added to our operating expenses. We are now, however, actually giving the reduced rate and are endeavoring to work out our operating problems so as to continue the reduction, and at this writing we are confident that we shall succeed.

Turning now to the higher rate which is being charged by the Western Union Telegraph Company throughout the country, inasmuch as that company in its application to you to be allowed to continue the increased rate sees fit to talk about our getting the "cream of the business" and operating 20 per cent or 25 per cent cheaper than the Western Union, we feel justified in calling your attention to a few facts in regard to the management of the Western Union Telegraph Company which in our opinion accounts for its unwillingness, and possibly inability, to compete any longer with the Postal Telegraph-Cable Company in the telegraph business. We call your attention to the following instances and illustrations of wasteful, extravagant, and inefficient management on the part of the Western Union Telegraph Company which has placed it in its present lamentable position and condition:

1. It has made ruinous contracts with the railroads. Formerly these telegraph-railroad contracts contained reasonable provisions as to the amount of free telegraph service given by the telegraph company to the railroad company and in regard to the railroad not taking any part of the telegraph earnings. When our company began to seek these railroad contracts, however, the Western Union made improvident and ruinous contracts. For instance, I understand that its present contract with the New York Central Railroad gives the railroad company unlimited telegraph service and even 5 per cent of the telegraph receipts at the railroad stations. That is equal to a 5 per cent dividend on its receipts. Again, when our 15-year contract with the Pennsylvania Railroad expired on June 30, 1917, that company wished us to renew it and we

refused because we found it involved a heavy annual loss to us. Nevertheless that company had no trouble in making a contract with the Western Union, but on what terms we do not know. The Western Union seems to be utterly profligate in its gifts of free telegraph service and apparently thinks that such extra telegraph service costs little. That is a ruinous mistake and more than any one thing has dragged the Western Union down to its present humiliating and mortifying position.

2. It has paid extravagant and unnecessary rentals to hotels throughout the country. It has done this to deprive our company of any part of the telegraph business in these hotels. These extravagant rentals do not increase the telegraph business a dollar. For illustration, both the Western Union and our company had offices in the Waldorf-Astoria Hotel, New York City, and each paid \$1,000 a year. Our business, of course, is much less than that of the Western Union, but we were content to pay the \$1,000. Suddenly the Waldorf-Astoria ejected us into the street, and we found that the Western Union had secretly made a contract with that hotel, by which we were ejected and the Western Union had a monopoly, and that monopoly still continues, but we venture to say that the price paid by the Western Union consumes all the profits of the telegraph business in that hotel and much more. This same ruinous practice of the Western Union prevails throughout the country.

3. It has established absolutely unnecessary branch offices. In some instances it has established branch offices, one on each side of our office, so as to catch the transient telegraph business before it reached our office. These branch offices are a heavy burden and expense and are only justified under circumstances requiring them for the convenience of the public without loss to the telegraph business.

4. It has opened offices in the buildings of large industrial concerns where no patron is served excepting the particular concern itself. This gives that particular concern a preferential service; in fact, in some instances the arrangements made by the Western Union have amounted to a discount on the telegraph rates.

5. It has paid commissions to janitors and bell-boys in apartment houses and commissions to cigar stores and commissions to drug stores in its insane desire to get the telegraph business away from our company. It has succeeded in getting that part of the business, but these commissions have eaten heavily into the narrow margin of profit in the telegraph business.

6. It has paid damage claims liberally in cities where we compete with that company, these damage claims being due to errors, delays, etc., in the transmission of telegraph messages. The law protects telegraph companies quite effectively against these claims, the transmission of telegrams by the electric current being such as to render unavoidable at certain times errors and delays. The favorite mode of obtaining a discount on telegraph bills, equivalent to a lower telegraph rate by concerns which are not particularly scrupulous as to getting lower telegraph rates, is to present such claims and if not allowed the party is then likely to take its business over to the competing telegraph company. We have lost many customers whose claims we refused to pay because they were not enforceable, and unless enforceable it is a criminal offense under the Acts of Congress to pay such claims. The liberality, however, with which the Western Union paid those claims finally led the Interstate Commerce Commission not long ago to investigate this self-same Western Union Telegraph Company in regard to paying these claims in order to get telegraph business away from us, and we understand that the worst abuses on the part of that company were corrected, but all this is another explanation of why the Western Union Telegraph Company can no longer meet competition in the way of telegraph rates—namely, waste, extravagance, and inefficiency in management.

7. It employs an army of solicitors to overrun the country and try to get the telegraph business away from the Postal Telegraph-Cable Company. You can easily see that soliciting telegraph business does not create telegraph business

any more than soliciting street-railway business would cause more travel on street railways, and yet for years the Western Union has spent vast sums of money in having high-priced solicitors approach the customers of the Postal Telegraph-Cable Company and try to persuade them to give their business to the Western Union Telegraph Company. All this is utter waste and helps to hasten the ruin.

We could refer to other abuses, but enough.

The Postal Telegraph-Cable Company has refused to be drawn into this unseemly and wasteful scramble for business. It has relied on good service and clean operating methods to build up its business. It has been generous to and considerate of its employees, and has always enjoyed the confidence of a loyal staff—hence its ability to successfully operate at the old rates.

The Postal Telegraph Company is paying better wages than the Western Union Company for the same kind of work. The Postal method is to fix wages according to individual merit and performance, and by fair, considerate treatment of its employees has gained and held their voluntary support and loyalty. The Western Union management believes it can purchase voluntary support and loyalty by means of periodical bonuses, although its fixed rate of pay, based upon hours of performance, is lower.

Yours very truly,

EDWARD REYNOLDS.

Vice-President and General Manager.

Included within the investigation as to the reasonableness of the rates and practices in this proceeding, there is also involved the question of discrimination made in charges for service to the United States Government as compared with those made to the public and to the state, county and municipal governments, the extent of which ranges from 33 $\frac{1}{3}$ per cent to more than 100 per cent. For example, the Western Union Telegraph Company maintains a schedule of special rates for the Federal Government which, when contrasted with the regular rates maintained and charged for public and state-government business wholly within the State, shows the following glaring discrimination on traffic between Carson City and Las Vegas, Nevada:

CARSON CITY TO LAS VEGAS, NEVADA

<i>U. S. Government Business</i> (With address and signature)	<i>General Public and State Government Business</i> (Exclusive of address and signature)
20 words—Day message.....24 cents	20 words—Day message.....88 cents
20 words—Night message.....19 cents	20 words—Night message.....48 cents

Further illustrating the question of discrimination on interstate traffic, the Commission exhibits the following comparative table of charges between Carson City and Washington, D. C.:

CARSON CITY, NEVADA, TO WASHINGTON, D. C.

<i>U. S. Government Business</i>	<i>General Public and State Government Business</i>
20 words—Day message.....\$0.48	Day message.....\$2.05
40 words—Day message.....0.96	Day message.....3.75
60 words—Day message.....1.45	Day message.....5.45
80 words—Day message.....1.92	Day message.....7.15
100 words—Day message.....2.40	Day message.....8.85

The rates for U. S. Government business, quoted above, include within the number of words both address and signature; those quoted for general public and state business do not include either address or signature within the counted number of words.

Our state, county, and municipal governments guarantee to the Western Union Telegraph Company the same rights, privileges and police regulations, etc., that are given by the United States Government,

which include the right to construct and maintain telegraph lines over and along any of the post-roads and public roads—state, county, or municipal—by right of franchise first obtained and, while we do not make a plea for any special rates or charges on behalf of our state government, we do protest against the discriminatory rates which are accorded to the Federal Government and which, because of the exceedingly large volume of business handled thereunder, result in loss which becomes a burden that it made up by assessing to the public higher charges than would otherwise be necessary if rates were uniformly apportioned and applied without discrimination.

The answer of the company, in this behalf, made several years ago, attempts to justify the aforesaid method of rating as follows:

By Act of Congress, July 24, 1866 (title 65, U. S. Rev. Stat., sec. 5263, et seq.), the provisions of which were accepted by this company, certain important powers and privileges were conferred by the United States Government, including the right to construct and maintain telegraph lines over and along any of the post-roads of the United States (a term which, by other Acts of Congress, has been declared to include all public roads and highways, while kept up and maintained as such), and, in exchange for those privileges, the telegraph company on its part assumed certain obligations—among others, to give messages sent on the official business of the United States Government priority over all other business, and to send such messages “at such rates as the Postmaster-General shall annually fix.” (Section 5266.)



CARSON CITY, NEVADA

STATE PRINTING OFFICE, : JOE FARNSWORTH, SUPERINTENDENT

1919

STATE OF NEVADA

List of Registered Automobiles and Motorcycles from July 1 to Sept. 30, 1919

THIRD QUARTERLY REPORT

Compiled by
GEORGE BRODIGAN
Secretary of State of the State of Nevada



CARSON CITY, NEVADA

STATE PRINTING OFFICE

: :

JOE FARNSWORTH, SUPERINTENDENT

1919

THIRD QUARTERLY REPORT OF REGISTERED AUTO- MOBILES AND MOTORCYCLES

(Compiled by GEORGE BRODIGAN)

The following pages, compiled in numerical rotation, contain names and addresses of owners who have registered their motor vehicles for the year 1919 with the Secretary of State from July 1, 1919, to September 30, 1919, inclusive, together with the number of the official license-plate issued to each for use as prescribed by law.

This form was adopted at request of some of the officials whose duties include the enforcement of the motor-vehicle laws.

LIST OF REGISTERED AUTOMOBILES FOR QUARTER ENDING SEPTEMBER 30, 1919

Make of vehicle is given last.

33127—Highway Dept., Carson City, Haynes.	33401—T. Hepp, Reno, Buick.
33128—Highway Dept., Carson City, Stude.	33402—Beers & Son, Minden, Pullman.
33129—Highway Dept., Carson City, Ford.	33403—Chas. Zuzak, Tonopah, Overland.
33130—Highway Dept., Carson City, Ford.	33404—Egisto Ceragioli, Sparks, Ford.
33131—Highway Dept., Carson City, Ford.	33405—J. A. Ryan, Junco, Ford.
33132—Highway Dept., Carson City, Ford.	33406—J. A. Ryan, Junco, Ford.
33133—Highway Dept., Carson City, Moreland.	33407—Wm. Frazier, Junco, International.
33134—Highway Dept., Carson City, Ford.	33408—Tom Defenbaugh, Winnemucca, Ford.
33135—Highway Dept., Carson City, Stude.	33409—Ben J. Sears, Imlay, Ford.
33136—Highway Dept., Carson City, Ford.	33410—A. T. Thompson, Winnemucca, Ford.
33137—Highway Dept., Carson City, Moreland.	33411—John M. Kirkley, Reno, Essex.
33138—Highway Dept., Carson City, Moreland.	33412—Andrew Mitchell, Gerlach, Ford.
33139—Highway Dept., Carson City, Moreland.	33413—P. Kiley, Derby, Ford.
33140—Highway Dept., Carson City, Moreland.	33414—Mrs. W. A. Goode, Carson City, Max.
33141—Highway Dept., Carson City, Moreland.	33415—H. Linneche, Reno, Ford.
33142—Edward Carmody, Reno, Chevrolet.	33416—J. J. Florshinger, Reno, Ford.
33143—Enos H. Jones, Reno, Pope-Hartford.	33417—Arelene Hooper, Tonopah, Dodge.
33144—R. W. Wells, Reno, Ford.	33418—W. Brookfield, Reno, Stutz.
33145—P. A. Lamb, Goldfield, Oakland.	33419—A. Loose, Lovelock, Reo.
33146—Jos. Petrucia, Goldfield, Oakland.	33420—Fernley Transfer Co., Fernley, Ford.
33147—G. H. Mullison, Fallon, Chevrolet.	33421—C. M. Hoover, Fallon, Oakland.
33148—Nev. Progressive G. M. Co., Sweetwater, Michigan.	33422—Jos. R. Beaucage, Sweetwater, Buick.
33149—Fred L. Fry, Beowawe, Buick.	33423—Nevada Packing Co., Reno, Chevrolet.
33150—J. C. Woodward, Tuscarora, Chevrolet.	33424—Vic Rubrans, Austin, Ford.
33151—B. A. Rives, Tonopah, Dorris.	33425—Daniels Bros., Austin, Overland.
33152—Nev. Mine Opr. Assn., Reno, Hudson.	33426—C. H. Springmeyer, Minden, Reo.
33153—J. H. Millet, Tonopah, Dorris.	33427—L. D. Summerfield, Reno, Reo.
33154—James Brown, Sulphur, Ford.	33428—C. E. Blaylock, Tonopah, Dodge.
33155—Alfred C. North, Tonopah, Cadillac.	33429—E. S. Masters, Tonopah, Peerless.
33156—Howard McKissick, Reno, Hudson.	33430—Eugene Davis, Eureka, Ford.
33157—Guy O. Dowden, Reno, Essex.	33431—E. B. Aubrey, Minden, Ford.
33158—C. F. Spillman, Reno, Essex.	33432—J. E. Brown, Reno, Ford.
33159—R. M. Chaplin, Reno, Chevrolet.	33433—Joseph Hammond, Ursine, Ford.
33160—Lester Raine, Sparks, Ford.	33434—Mrs. H. M. Logan, Round Mtn., Ford.
33161—Victor Pierros, Goldfield, Ford.	33435—M. E. Paris, Platora, Ford.
33162—George B. Thomas, Ely, Home-made.	33436—Robert W. McSherry, Tonopah, Reo.
33163—J. H. Harrington, Ely, Ford.	33437—Pietro Magri, Reno, Buick.
33164—H. M. Hamlin, Mina, Ford.	33438—Walter L. Boone, Stewart, Chevrolet.
33165—Martin Loxarta, Winnemucca, Buick.	33439—John Dornan, Ely, Ford.
33166—Theodore J. Miller, Paradise, Studebaker.	33440—Wm. Ferguson, Sunnyside, Oldmobile.
33167—J. F. Harvey, Winnemucca, Jeffery.	33441—J. W. Ferguson, Sunnyside, Ford.
33168—C. E. Weikel, Winnemucca, Jeffery.	33442—C. L. Grider, Kimberly, Overland.
33169—Pacific Livestock Co., Amos, Ford.	33443—J. C. Hammer, East Ely, Ford.
33170—A. C. Bechman, Reno, Maxwell.	33444—A. C. Kirkeby, Osceola, Ford.
33171—E. H. Abrams, Lovelock, Ford.	33445—J. O. McKernan, Ely, Ford.
33172—Frank C. Green, Tonopah, Buick.	33446—Pete Mariluch, Shellbourne, Dodge.
33173—Mrs. Mary Harrington, Tonopah, Buick.	33447—J. P. Rumbaugh, East Ely, Jeffery.
33174—Vincent P. Gianella, Reno, Dodge.	33448—G. A. Sowers, Ely, Dodge.
33175—G. W. Downey, Fallon, Ford.	33449—J. L. Rockabrand, McGill, Dodge.
33176—Ed. Barryman, Preston, Ford.	33450—J. H. Crowley, Sparks, Knight-Over.
33177—R. J. Pierson, Lovelock, Haynes.	33451—T. Sakahara, Sparks, Great Western.
33178—W. A. Schroeder, Reno, Hupmobile.	33452—Ugo Del Grande, Verdi, Overland.
33179—W. C. Gill, Reno, Willys-Knight.	33453—John Stack, McGill, Chevrolet.
33180—Elmer Hylton, Jiggs, Oakland.	33454—J. C. Wholey, Austin, Ford.
33181—W. B. Lughkin, Tonopah, Ford.	33455—Ennis Brown, Reno, R. C. H.
33182—H. Hamlin, Tonopah, Ford.	33456—F. O. Stickney, Yerington, Dodge.
33183—Einar Oas, Ely, Buick.	33457—Geo. Stauts, Lovelock, Maxwell.
33184—J. A. Beemer, Schurz, Dodge.	33458—W. S. Goodwin, Las Vegas, Hupmobile.
33185—Chas. Doherty, Carlin, Ford.	33459—James Cashman, Searchlight, Hup.
33186—Henry Dillake, Montello, Ford.	33460—Oscar Geertsen, Metropolis, Chevrolet.
33187—Merl Metz, Reno, Dodge.	33461—A. M. Trolson, Fallon, Ford.
33188—Churchill County Bank, Fallon, Ford.	33462—D. C. Ryckman, Tonopah, Maxwell.
33189—C. H. Dennison, Reno, Apperson.	33463—Wm. Burkhardt, Goodsprings, Ford.
33190—V. V. Wyatt, Reno, Ford.	33464—Manuel Bastida, Charleston, Chevrolet.
33191—W. T. Shurtleff, Reno, Ford.	33465—Mrs. C. H. Atherton, Carson, Dodge.
33192—Bob Roy, Carson City, Chevrolet.	33466—Verdi Lumber Co., Reno, Ford.
33193—Lewis Parks, Las Vegas, Maxwell.	33467—Verdi Lumber Co., Reno, Ford.
33194—Dan McDonald, Las Vegas, Ford.	33468—Verdi Lumber Co., Reno, Ford.
33195—Wittenberg Wh. & Tfr. Co., Tonopah, Pierce-Arrow.	33469—W. E. Zoebel, Reno, Hudson.
33196—Wittenberg Wh. & Tfr. Co., Tonopah, Dorris.	33470—W. G. Kline, Reno, Buick.
33197—C. F. Scott, Jiggs, Oakland.	33471—G. G. Taggart, Arlemont, Ford.
33198—G. E. Truitt, North Ford, Oakland.	33472—John T. Whitmire, Reno, Overland.
33199—T. M. Gounsell, San Jacinto, Oakland.	33473—Joe Schneider, Carson City, Ford.
33200—Edna M. Furlong, Elko, Overland.	33474—Norma Dickson, Simpson, Ford.
	33475—H. J. Ellart, Reno, Overland.
	33476—Harry Tucker, Fallon, Chevrolet.

- 38477—H. R. Landis, Reno, Chevrolet.
 38478—Adam Niepoth, Reno, Overland.
 38479—L. Th. deVetsera, Tuscarora, Pope-H.
 38480—Keith Emery, Sparks, Ford.
 38481—L. Benetti, Sparks, Ford.
 38482—Wm. J. Crozier, Las Vegas, Studebaker.
 38483—A. Erickson, Elko, Chevrolet.
 38484—R. W. Gorton, Las Vegas, Buick.
 38485—Mrs. J. H. Cahill, Austin, Chevrolet.
 38486—Joe Quilich, Wellington, Maxwell.
 38487—G. R. Leidy, Fallon, King.
 38488—Dept. of Interior, Elko, Ford.
 38489—O. H. Groth, Reno, Oakland.
 38490—Arthur J. Kingman, Reno, Overland.
 38491—Bill Rice, Reno, Ford.
 38492—W. A. Ray, Tonopah, Buick.
 38493—O. J. Belleville, Tonopah, Hudson.
 38494—John Riordan, Elko, Overland.
 38495—I. Landa, Elko, Ford.
 38496—J. Miles, Charleston, Ford.
 38497—Pete Aiazzi, Carlin, Ford.
 38498—Heitman & Thies, Yerington, Chevrolet.
 38499—Henry M. Payne, Sparks, Overland.
 38500—Gray, Reid & Co., Fallon, Ford.
 38501—Mrs. P. H. Phillips, Reno, National.
 38502—J. W. Cook, Manhattan, Ford.
 38503—A. Henriksen, Lovelock, Studebaker.
 38504—Jesse Baker, Gold Creek, Dodge.
 38505—Ball & Vogeli, Fallon, Ford.
 38506—U. W. Harwood, Tonopah, Chandler.
 38507—Al. McCoy, Tonopah, Chalmers.
 38508—J. Nalaskowski, Hornsiver, Ford.
 38509—M. L. Meeks, Reno, Ford.
 38510—Geo. Wingfield, Reno, Dorris.
 38511—Sheldon Husston, Fallon, Studebaker.
 38512—Joe Sceirine, Yerington, Buick.
 38513—Rochester Mines Co., Rochester, Ford.
 38514—R. W. Robinson, Wonder, Dodge.
 38515—Henry Talcott, Unionville, Ford.
 38516—Sander Gyoiff, Willard, Dodge.
 38517—Gilbert Kneiss, Reno, Oakland.
 38518—A. D. Bird, Reno, Ford.
 38519—Edward J. Deck, Pioche, Ford.
 38520—L. C. Griffin, Reno, Buick.
 38521—Jas. E. Hughes, Mesquite, Republic.
 38522—James Johnson, Lovelock, Flanders.
 38523—L. Wood, Fallon, Ford.
 38524—C. E. Stewart, Reno, Studebaker.
 38525—Andrew Thompson, Winnemucca, Int.
 38526—Albion Sil. M. Co., Golconda, Ford.
 38527—Mary F. Langwith, Winnemucca, Buick.
 38528—Carl Lundberg, Sparks, Ford.
 38529—Mrs. Ruth Edises, Reno, Ford.
 38530—Thos. Gordon, Reno, Ford.
 38531—Geo. K. Jensen, Sparks, Ford.
 38532—Paul Butler, Flanigan, Ford.
 38533—A. D'Arcy, Goldfield, Cadillac.
 38534—C. A. Starr, Reno, Oldsmobile.
 38535—Louie King, Reno, Buick.
 38536—John Aitken, Reno, Overland.
 38537—John Gardinali, Eureka, Dodge.
 38538—Joe Leavitt, Jr., Mesquite, Ford.
 38539—Joseph McDermott, Mina, Federal.
 38540—Mrs. J. McDermott, Mina, Ford.
 38541—Charles Downing, Mt. Gomery, Ford.
 38542—Maurice Isaac, Tonkin, E. M. F.
 38543—Geo. F. Campbell, Carson City, Ford.
 38544—B. E. Wiley, Lovelock, Buick.
 38545—George McKay, Sparks, Ford.
 38546—Mary Larson, Elko, Ford.
 38547—Arne W. Parris, Elko, Buick.
 38548—J. L. Wadsworth, Panaca, Chevrolet.
 38549—Ingersoll-Rand Co., Tonopah, Dodge.
 38550—John Poco, Reno, Cadillac.
 38551—B. R. Harris, Reno, Ford.
 38552—P. D. W. Leod, Tonopah, Dodge.
 38553—W. H. Smiley, Deeth, Dodge.
 38554—R. E. Gamble, Mina, Ford.
 38555—J. S. Kean, Reno, Studebaker.
 38556—Roy R. Woods, Montello, Studebaker.
 38557—Mrs. M. E. Vogt, Reno, Maxwell.
 38558—Highway Dept., Carson City, Moreland.
 38559—Highway Dept., Carson City, Moreland.
 38560—Highway Dept., Carson City, Moreland.
 38561—Highway Dept., Carson City, Moreland.
 38562—Highway Dept., Carson City, Moreland.
 38563—John H. Miller, Contact, Ford.
 38564—Louis R. Hille, Las Vegas, Oldsmobile.
 38565—Geo. B. Haggood, Vya, Chevrolet.
 38566—R. S. Bechtel, Lovelock, Ford.
 38567—James Sommerville, Las Vegas, Ford.
 38568—D. A. Smith, Mina, Essex.
 38569—J. H. Le Foe, Goldfield, Ford.
 38570—R. D. Eicheberger, Reno, Studebaker.
 38571—Geo. N. Brady, Golconda, Ford.
 38572—John Harris, Reno, Dodge.
 38573—James Roberts, Austin, Maxwell.
 38574—Dept. of Interior, Reno, Dodge.
 38575—C. P. Ball, Las Vegas, Ford.
 38576—R. E. Barrington, Stewart, Chevrolet.
 38577—Sam Wood, Virginia City, Ford.
 38578—H. E. Downey, Tonopah, Dodge.
 38579—Jos. S. Smith, Las Vegas, Studebaker.
 38580—R. W. Quinn, Elko, Essex.
 38581—Niels Fanerby, Elko, Nash.
 38582—Ne. Hoep. Mental Dis., Reno, Ford.
 38583—F. A. Schlanser, Goldfield, Lexington.
 38584—A. M. Boyce, Yerington, Saxon.
 38585—Louis Meiss, Reno, Chevrolet.
 38586—John Block, Reno, Overland.
 38587—Henry H. Sheeline, Reno, Buick.
 38588—Ralph Wardle, Tonopah, Dodge.
 38589—Chas. Hendryx, Reno, Ford.
 38590—Fred D. Fox, Verdi, Ford.
 38591—Union Oil Co., Reno, Ford.
 38592—J. E. Hearn, McDermitt, Ford.
 38593—Highway Dept., Carson City, Ford.
 38594—Tom Crosby, Reno, Cadillac.
 38595—W. T. White, Reno, Chandler.
 38596—W. Morois, Minden, Locomobile.
 38597—W. Morois, Minden, Buick.
 38598—Battista Luchetti, Sparks, Oakland.
 38599—Lloyd T. Lord, Reno, Ford.
 38600—Joe Yragui, Winnemucca, Dodge.
 38601—W. A. Carter, Reno, Ford.
 38602—Oliver L. Chambers, Reno, Ford.
 38603—F. A. Hewlett, Reno, Ford.
 38604—Joe Sterro, Ely, Ford.
 38605—J. B. Kitch, Ely, Overland.
 38606—Max McCarthy, Gerlach, Ford.
 38607—Fred Frantsen, Gardnerville, Dodge.
 38608—E. H. Torque, Reno, Maxwell.
 38609—Ada Hanson, Ely, Oldsmobile.
 38610—H. A. Goodwin, Ely, Metc.
 38611—Philip Erostarbe, Wellington, Maxwell.
 38612—Louis Arouze, Smith, Ford.
 38613—J. L. Cookrill, Palisade, Overland.
 38614—R. F. Combs, Fallon, Ford.
 38615—C. C. Jones, Reno, Ford.
 38616—George Evans, Lovelock, Studebaker.
 38617—R. T. Jenkins, Reno, Fageol.
 38618—Nevada Zinc M. Co., Clover City, Ford.
 38619—S. R. Wheeling, Reno, Ford.
 38620—Frank S. Menz, Stewart, Maxwell.
 38621—Fred N. Gordon, Tonopah, Ford.
 38622—Mrs. B. F. Howard, Reno, Chevrolet.
 38623—T. L. Davis, Elko, Ford.
 38624—August Hill, Goldfield, Knox.
 38625—G. W. Dyckman, Reno, Overland.
 38626—John Walczak, Eureka, Hewitt-Ludlow.
 38627—Samoville & Flagg, Inc., Reno, Reo.
 38628—Carrie S.-Lead M. Co., Tonopah, Dodge.
 38629—Tule Silver Dol. M. Co., Goldfield, Ford.
 38630—Vincent Mattiucci, Las Vegas, Ford.
 38631—E. O. Midyett, Reno, Ford.
 38632—Pastor Uriarte, Lovelock, Overland.
 38633—J. R. Fulton, Reno, Ford.
 38634—Ivor E. Johnson, Reno, Ford.
 38635—J. F. Christopherson, Baker, Republic.
 38636—C. R. Evans, Goldfield, Packard.
 38637—W. A. Moyle, Ely, Reo.
 38638—R. Campbell, Jiga, Dodge.
 38639—J. G. Dawson, Reno, Willys.
 38640—Helen G. Scott, Reno, Cadillac.
 38641—W. J. Wood, Goldfield, Ford.
 38642—Joe Stein, Yerington, Case.
 38643—Oliver McCarty, Winnemucca, Inter.
 38644—Western Mach. & Eng. Co., Reno, Reo.
 38645—H. A. Meinekethen, Winnemucca, Chev.
 38646—Tom West, Las Vegas, Page.

- 38647—E. Erickson, Verdi, Buick.
 38648—F. M. Billings, Tonopah, Ford.
 38649—Wood Curtis Co., Reno, Ford.
 38650—Mrs. R. C. Louck, Reno, Chevrolet.
 38651—Dorman Wade, Minden, Overland.
 38652—L. P. Wheeler, Reno, Buick.
 38653—Bidar & Florio, Eureka, Hupmobile.
 38654—Oswald Riley, Las Vegas, Chevrolet.
 38655—James Estes, Battle Mountain, Ford.
 38656—W. Stoker, Lovelock, Saxon.
 38657—R. L. Morgan, Rand, Metz.
 38658—Highway Dept., Carson City, Peerless.
 38659—Highway Dept., Carson City, Peerless.
 38660—Highway Dept., Carson City, Peerless.
 38661—Highway Dept., Carson City, Peerless.
 38662—Highway Dept., Carson City, Peerless.
 38663—Highway Dept., Carson City, Peerless.
 38664—Highway Dept., Carson City, Peerless.
 38665—Highway Dept., Carson City, Peerless.
 38666—Highway Dept., Carson City, Peerless.
 38667—Highway Dept., Carson City, Peerless.
 38668—Highway Dept., Carson City, Inter.
 38669—Highway Dept., Carson City, Inter.
 38670—T. S. Ferretto, Reno, Chevrolet.
 38671—Dunham, Carrigan & Hayden, Reno, Dodge.
 38672—E. S. Gladding, Virginia City, Oakland.
 38673—Robert K. Scouler, Reno, Buick.
 38674—W. C. Morgan, Las Vegas, Ford.
 38675—Fred A. Sawyer, Reno, Studebaker.
 38676—O. J. Clifford, Reno, Ford.
 38677—Knox Divide Mfg. Co., Tonopah, Ford.
 38678—H. D. West, Reno, Buick.
 38679—Highway Dept., Carson City.
 38680—Highway Dept., Carson City, Ford.
 38681—Highway Dept., Carson City.
 38682—Alex Wise, Gold Hill, Dodge.
 38683—Rosa Fox, Vya, Ford.
 38684—Fred Biester, Gardnerville, Overland.
 38685—H. A. Leach, Wells, Oldsmobile.
 38686—E. W. Blair, Tonopah, Chandler.
 38687—Lester C. Munk, Lovelock, Chevrolet.
 38688—Everett F. Kofoed, Lovelock, Ford.
 38689—Chester A. Benson, Reno, Ford.
 38690—Laurence A. Gulling, Reno, Maxwell.
 38691—F. E. Hill, Goldfield, Moreland.
 38692—R. E. Rice, Reno, Dodge.
 38693—States Mutual Con. M. Co., Searchlight, Ford.
 38694—MiBo Florio, Reno, Chevrolet.
 38695—W. H. Gibson, Hawthorne, Winton.
 38696—F. M. Andrews, Luning, Buick.
 38697—Jno. Witt, Goldfield, Chandler.
 38698—Goldfield Tule Canyon P. M. Co., Ford.
 38699—J. P. Otis, Paradise, Ford.
 38700—H. Loose, Lovelock, Franklin.
 38701—E. C. Puryear, Moor, Ford.
 38702—Ralph Schmidt, Tuscarora, Ford.
 38703—Sam Watkins, Reno, Geo.
 38704—Dr. J. E. Nave, Wonder, Ford.
 38705—Anna Steinberger, Tonopah, Oldsmobile.
 38706—Wm. Herre, Reno, Garford.
 38707—Gus Rainier, Tonopah, Buick.
 38708—Hyatt Bros., Fallon, Ford.
 38709—Mrs. D. P. McCarthy, Tonopah, Dodge.
 38710—C. Ciofani, Reno, Oldsmobile.
 38711—J. D. Luzier, Yerington, Chevrolet.
 38712—H. W. Herd, Tonopah, Chalmers.
 38713—Martin Hachquet, Elko, Chandler.
 38714—Big Ledge Divide Con. M. Co., Tonopah, Dodge.
 38715—Olive Howard, Winnemucca, Chevrolet.
 38716—Frank Amuchartegi, McDermitt, Olds.
 38717—Cap Capurro, Winnemucca, Buick.
 38718—John Gullings, Winnemucca, Ford.
 38719—Ernest Brown, Winnemucca, Chevrolet.
 38720—H. B. Corkin, Winnemucca, Studebaker.
 38721—C. E. McCally, Tonopah, Ford.
 38722—Eugene Becker, Lovelock, Overland.
 38723—John J. Hill, Carson City, Maxwell.
 38724—Bob Emmitt, Minden, Ford.
 38725—Donald W. Everett, Minden, Ford.
 38726—Standard Oil Co., Wells, Ford.
 38727—Sam Hamion, Reno, Ford.
 38728—George Burke, Reno, Ford.
 38729—Standard Oil Co., Fallon, Mack.
 38730—L. P. Kimball, Beatty, Ford.
 38731—W. T. Stewart, Sr., Alamo, Ford.
 38732—Mrs. Marion Maher, Jarbidge, Buick.
 38733—Martin Sorenson, Gardnerville, Olds.
 38734—W. A. Smith, Pioche, Ford.
 38735—Frank J. Byer, Austin, Oakland.
 38736—Duan Freeman, Verdi, Ford.
 38737—Lahontan Oil Syndicate, Reno, Ford.
 38738—Albert Lund, Reno, Ford.
 38739—L. T. Telford, Reno, Ford.
 38740—Edwin A. Stevens, Tonopah, Marion.
 38741—Frisco Store, Tonopah, Ford.
 38742—Tonopah Mining Co., Tonopah, Ford.
 38743—J. W. Smith, San Jacinto, Ford.
 38744—V. E. Hicks, Elko, Ford.
 38745—James E. Powell, Gardnerville, Hudson.
 38746—Reno P. L. & W. Co., Reno, Dodge.
 38747—S. E. Palmer, Lovelock, Ford.
 38748—Rudolph Miller, Fernley, Lexington.
 38749—E. T. Brambley, Sparks, Ford.
 38750—A. Hankammer, Verdi, Hupmobile.
 38751—C. H. Karns, Reno, Scripps-Booth.
 38752—Sam Garbarino, Yerington, Ford.
 38753—H. G. Curtiss, Elko, Dodge.
 38754—C. H. Weed, Winnemucca, Ford.
 38755—United Stage and Taxi Co., Ely, Buick.
 38756—United Stage and Taxi Co., Ely, Ford.
 38757—United Stage and Taxi Co., Ely, Ford.
 38758—George Wright, Stewart, Ford.
 38759—National R. & I. Co., Given in place of 34590, which was broken.
 38760—L. L. Mushett, Tonopah, Oldsmobile.
 38761—S. L. Williams, Sparks, Geo.
 38762—W. E. Cole, McDermitt, Ford.
 38763—V. E. Scott, Reno, Chevrolet.
 38764—C. E. Fletcher, Reno, Hupmobile.
 38765—W. A. K. Robertson, Austin, Pope-H.
 38766—Wm. Holbrook, Wellington, Ford.
 38767—Jas. E. Stevens, Ely, Studebaker.
 38768—John Ayarbie, Shellbourne, Saxon 6.
 38769—Frank F. Williams, Ely, Pilot.
 38770—E. Andrews, Ely, Ford.
 38771—Highway Dept., Carson, Nash-Quad.
 38772—B. F. Hicks, Fallon, Ford.
 38773—F. S. Smith, Derby, Oldsmobile.
 38774—Nev. Eng. & Sup. Co., Fairview, Vini.
 38775—F. M. Barrown, Eureka, Ford.
 38776—H. J. Rutherford, Deeth, Ford.
 38777—Geo. E. Bennett, Ely, Buick.
 38778—Highway Dept., Carson, Nash-Quad.
 38779—C. M. Krummes, Gardnerville, Stude.
 38780—Mrs. C. K. Harvey, Fallon, Ford.
 38781—Wm. M. Kennedy, Verdi, Buick.
 38782—Oscar Bruylman, Reno, Chalmers.
 38783—Mike Farretto, Reno, Pilot.
 38784—C. G. Swingle, Hazen, Ford.
 38785—Garat & Co., White Rock, Hudson.
 38786—Garat & Co., White Rock, Ford.
 38787—Fred Burner, Yerington, Oldsmobile.
 38788—H. A. Geisendorfer, Tonopah, Ford.
 38789—P. Masri Co., Reno, Ford.
 38790—J. A. Selstrom, Tonopah, Scripps-B.
 38791—O. C. Paker, Ely, Geo.
 38792—Dr. M. E. Eastman, Reno, Chevrolet.
 38793—Div. Cons. M. Co., Tonopah, Ford.
 38794—J. Ceresola, Sparks, Buick.
 38795—C. J. Ismert, Tonopah, Ford.
 38796—Henry Ostroff, Reno, Scripps-Booth.
 38797—W. Schmidt, Sparks, Chevrolet.
 38798—Tonopah Div. M. Co., Tonopah, Ford.
 38799—G. B. Stannard, Hawthorne, Ford.
 38800—G. W. Rockwell, Hawthorne, Auburn.
 38801—T. C. Johnson, Lovelock, Ford.
 38802—Mrs. R. A. Hash, Battle Mtn., Buick.
 38803—Chas. A. Peyser, Reno, Ford.
 38804—Chas. A. Peyser, Reno, Chevrolet.
 38805—John W. Bradley, Sparks, Studebaker.
 38806—George Causulas, Sparks, American.
 38807—Jess Mihendy, Fernley, Ford.
 38808—Wm. Reid, Reno, Dodge.
 38809—Ray W. Harris, Mina, Ford.
 38810—J. A. Lawson, Silver City, Maxwell.
 38811—S. Barton & Thos. Godfrey, Tonopah, Hudson.

- 38812—Lawrence Masini, Yerington, Hup.
 38818—W. N. Schuyler, Las Vegas, Ford.
 38814—W. A. Swarts, Reno, Ford.
 38815—S. W. Gibson, Reno, Chevrolet.
 38816—Raymond Mitchell, Reno, Buick.
 38817—Dewey Tang, Round Mtn., Ford.
 38818—Jas. Arnold, Reno, Ford.
 38819—W. C. Deacon, Elko, Ford.
 38820—G. T. Hamblin, Joseco, Ford.
 38821—Mrs. R. A. Trimmer, Genoa, Ford.
 38822—Standard Oil Co., Lovelock, Mack.
 38823—J. H. Wiggs, Reno, Maxwell.
 38824—City of Reno, Reno, Oldsmobile.
 38825—George Hardman, Battle Mtn., Ford.
 38826—A. G. Sturgeon, Wabuska, Ford.
 38827—John Joe (Indian), Lamolite, Stude.
 38828—E. G. Reynolds, Currie, Dodge.
 38829—O. S. Hofman, Winnemucca, Reo.
 38830—E. Reinhart Co., Winnemucca, Buick.
 38831—Bert Schofield, Winnemucca, Ford.
 38832—Pat Lorenzana, Winnemucca, Ford.
 38833—Louis A. Spellier, Reno, Overland.
 38834—L. Carrington, Reno, Ford.
 38835—Felix Bernedo, Austin, Ford.
 38836—M. L. Davenport, Tonopah, Overland.
 38837—C. Z. Olson, Clover City, Ford.
 38838—J. E. Hartwell, Elko, Ford.
 38839—Edwin E. Blair, Montello, Ford.
 38840—Mrs. Roy Johnstone, Divide City, Ford.
 38841—Gus. Puccinelli, Elko, Ford.
 38842—Kutcher & Curtiss, Las Vegas, Ford.
 38843—Christ Westergard, Lovelock, Ford.
 38844—F. A. Conant, Reno, Maxwell.
 38845—Associated Oil Co., Reno, Dodge.
 38846—Mrs. Mary I. Lukey, Reno, Scripps-B.
 38847—Joe Venuto, Ely, Chandler.
 38848—John Damon, Dayton, Chevrolet.
 38849—A. M. Collini, McGill, Buick.
 38850—George Roth, Fallon, Ford.
 38851—Arvid Stanford, Las Vegas, Ford.
 38852—A. F. Marker, Fallon, Ford.
 38853—Thos. H. Robinson, Reno, Cadillac.
 38854—Round Mtn. M. Co., Round Mtn., Dodge.
 38855—J. E. Edwards, Reno, Essex.
 38856—Standard Oil Co., Las Vegas, Ford.
 38857—Morris Korshet, Reno, Kissel Kar.
 38858—David E. Boet, Reno, Ford.
 38859—Standard Oil Co., Carson City, Mack.
 38860—Highway Dept.
 38861—Cooper & Uniacke, Lovelock, Dodge.
 38862—Geo. E. Truax, Battle Mtn., Reo.
 38863—Miles Mandarich, Ruth, Buick.
 38864—Teacup Mining Co., Cherry Creek, Ford.
 38865—Buster Cleveland, Ely, Ford.
 38866—Mrs. Nell B. Frick, Reno, Buick.
 38867—G. A. Neilson, Steamboat, Ford.
 38868—Chas. E. Glazier, Fallon, Essex.
 38869—F. Johnson, Dayton, Mitchell.
 38870—Eric Carlson, Midas, Overland.
 38871—Andrew A. Lekva, Tonopah, Ford.
 38872—Earl Heath, Las Vegas, Ford.
 38873—A. P. Mitchell, Cobre, Overland.
 38874—Jas. M. Keir, Wonder, Ford.
 38875—Frank H. Biffer, Wonder, Ford.
 38876—B. A. Dovenor, Reno, Stutz.
 38877—F. C. Bene, Reno, Ford.
 38878—Mrs. E. E. Mason, Reno, Marmon.
 38879—Fred J. Rufi, Battle Mountain, Ford.
 38880—Wm. T. Stewart, Jr., Alamo, Stude.
 38881—W. H. McLean, Tonopah, Maxwell.
 38882—John G. Lucich, Tonopah, Ford.
 38883—Sam Parker, McGill, Ford.
 38884—Wm. J. Stack, Gold Hill, Dodge.
 38885—S. F. Whitney, Pioche, Ford.
 38886—A. J. McCuiston, Wells, Ford.
 38887—A. D. Drumm, Fallon, Ford.
 38888—A. W. Geiger, E. S. McCurdy, Tonopah, Ford.
 38889—R. R. Emmitt, Carson City, Ford.
 38890—George Oka, Gardnerville, Chevrolet.
 38891—R. D. Forrest, Tonopah, Hupmobile.
 38892—Beowawe Merc. Co., Beowawe, Over.
 38893—K. C. Davidson, Elko, Ford.
 38894—Chas. Pefley, Reno, Chevrolet.
 38895—W. H. Braden, Goldfield, Ford.
 38896—Tobias Boel, Reno, Chevrolet.
 38897—Anton Ozanish, Tonopah, Chevrolet.
 38898—Joe Pedro, Tonopah, Stoddard-Dayton.
 38899—H. C. Stimler & Co., Tonopah, Naah.
 38900—Homer Winters, Winnemucca, Hup.
 38901—T. H. Smith, Beatty, Ford.
 38902—W. H. Murray, Reno, Ford.
 38903—W. R. Robrecht, Reno, Ford.
 38904—Dwight Hood, Reno, Ford.
 38905—S. G. Broyles, Battle Mountain, Ford.
 38906—Harvey C. Majors, Reno, Ford.
 38907—Carson Brewing Co., Carson City, Ford.
 38908—G. A. Raymer, Reno, Cadillac.
 38909—Riverside Mill Co., Reno, Dodge.
 38910—Wm. H. Harwood, Hamilton, Ford.
 38911—Jay S. Jones, Amos, Jeffery.
 38912—E. R. Findley, Goldfield, Essex.
 38913—Jas. L. Shute, Lovelock, Ford.
 38914—John I. Cazier, Wells, Dodge.
 38915—Fred G. Benninghoff, Battle Mtn., Ford.
 38916—Leland Stockdale, Carson City, Reo.
 38917—W. Cain, Reno, Ford.
 38918—B. Guerena, Lamolite, Ford.
 38919—Frank Walker, Pioche, Ford.
 38920—Mrs. S. G. Lamb, Winnemucca, Olds.
 38921—William Freemont, Willow Point, Ford.
 38922—E. J. Lyons, Fallon, Ford.
 38923—Geo. L. Ullom, Lovelock, Reo.
 38924—L. B. Norton, Reno, Reo.
 38925—Dale B. Pruett, Carson City, Saxon.
 38926—Donald J. Fraser, Reno, Oldsmobile.
 38927—Mike Sala, Ely, Overland.
 38928—James Doutre, Shellbourne, Hudson.
 38929—F. S. McGuire, Lower Rochester, Ford.
 38930—Marcel Espitalier, Reno, Ford.
 38931—Standard Oil Co., Reno, Studebaker.
 38932—Ed. Schreck, Elko, Ford.
 38933—Harry Irland, Aurum, Dodge.
 38934—E. C. Olsen, Reno, Willys-Knight.
 38935—W. Dee Jones, Mina, Ford.
 38936—A. P. Green, Mt. Gomery, E. M. F.
 38937—C. E. Cummings, Lovelock, Chevrolet.
 38938—Joe Azuarez, Wellington, Chevrolet.
 38939—A. Cousin, Reno, Studebaker.
 38940—Central Pacific Ry., Winnemucca, Ford.
 38941—Chicago P. Tool Co., Tonopah, Dodge.
 38942—Thos. Jayo, E. Co., Studebaker.
 38943—E. J. Heidtmann, Reno, Overland.
 38944—A. N. Bliefeldt, L. Rochester, Ford.
 38945—J. W. Berg, Round Mtn., Dodge.
 38946—Wm. Wilson, Reno, Ford.
 38947—G. F. Gifford, Ely, Ford.
 38948—Vance Britte, Searchlight, Apperson.
 38949—Miss Bobbie Patterson, Tonopah, Essex.
 38950—S. Christensen, Sparks, Ford.
 38951—L. D. Pepin, Reno, Dodge.
 38952—Mrs. A. Haworth, Battle Mtn., Ford.
 38953—Raymond Mitchell, Reno, Buick (issued to replace 38816, lost in transit).
 38954—James Oliver, Stewart, Ford.
 38955—M. W. Prussia, Winnemucca, Maxwell.
 38956—F. J. Button, Winnemucca, Ford.
 38957—Jas. M. Amonetti, Rawhide, Ford.
 38958—H. K. Harvey, Paradise, Hupmobile.
 38959—Ed. McGhee, Winnemucca, Pratt-Elk.
 38960—P. A. Mink, Winnemucca, Ford.
 38961—V. Dondoro, Reno, Ford.
 38962—W. W. Anderson, Reno, Ford.
 38963—F. E. Craig, Reno, Buick.
 38964—Bert A. Adams, Reno, Ford.
 38965—Fred Lancaster, Rowland, Dodge.
 38966—Albert Nicholson, Minden, Ford.
 38967—Willis Smith, Yerington, Ford.
 38968—Hybla Mining Co., Pioche, Jeffery.
 38969—Roy Leach, Pioche, Ford.
 38970—Albert Evans, Virginia City, Stude.
 38971—Lindley & Co., Reno, Ford.
 38972—Dan T. Nichols, Preston, Dodge.
 38973—Myrta A. Galli, Reno, Overland.
 38974—Ferris MacDoolittle, Las Vegas, Buick.
 38975—L. M. Bellinger, Lamolite, Oakland.
 38976—Elmer Roseberry, Tuscarora, Oldsmobile.
 38977—C. A. Snider, Las Vegas, Chandler.
 38978—R. O. Houghtaling, Goldfield, Ford.
 38979—Oliver Ahlers, Fernley, Ford.

- 38980—J. W. Middleton, Fernley, Maxwell.
 38981—Chas. Stindt, Pioche, Buick.
 38982—E. M. Lusty, Reno, Oldsmobile.
 38983—M. E. Giffin, Fallon, Saxon.
 38984—Ramon Inchaasch, Wellington, Buick.
 38985—Joseph Giraud, Reno, Oldsmobile.
 38986—D. P. Buchanan, Ash Meadows, Ford.
 38987—J. M. Ullom, Las Vegas, Saxon.
 38988—V. E. Olson, Reno, Overland.
 38989—Al. Mills, Goldfield, Ford.
 38990—L. W. Whiting, Mina, Hupmobile.
 38991—Jack Shepard, Elko, Buick.
 38992—Ed. Lazarus, Reno, Chevrolet.
 38993—J. P. Blanchard, Lovelock, Ford.
 38994—W. P. Harmon, Fallon, Chevrolet.
 38995—James Ryan, Caliente, Ford.
 38996—Carl Moser, Mina, Ford.
 38997—O. M. Todd, Reno, Haynes.
 38998—Gold. Can. Dredg. Co., Dayton, Buick.
 38999—F. W. Cook, Genoa, Chalmers.
 39000—J. H. Miller, Tonopah, Dorris.
 39001—Albert Martin, Reno, Buick.
 39002—Geo. W. Clark, Reno, Pierce-Arrow.
 39003—George Moran, Reno, Chandler.
 39004—P. W. Simms, Reno, Chevrolet.
 39005—L. Palletti, Minden, Buick.
 39006—Standard Oil Co. Reno, Ford.
 39007—John Hoffman, Gardnerville, Ford.
 39008—Norma Ellis, Minden, Ford.
 39009—S. T. Aguirre, Las Vegas, Studebaker.
 39010—Joe Venuto, Ely, Oakland.
 39011—Alfred Scambi, Tuscarora, Ford.
 39012—Ralph B. Steiner, Tonopah, Ford.
 39013—Geo. M. Smitten, Reno, Ford.
 39014—Alfred Pitman, Reno, Cadillac.
 39015—Ida Cleveland, Schurz, Chevrolet.
 39016—W. M. Boyle, Elko, Packard.
 39017—Samuel W. Belford, Reno, Hudson.
 39018—R. H. Murphy, Elko, Ford.
 39019—D. O. Komoto, Yerington, Chevrolet.
 39020—Alexis Smith, Las Vegas, Ford.
 39021—Cazier Bros., Preston, Ford.
 39022—Victor Venturino, Eureka, Ford.
 39023—Thos. W. Kendall, Goldfield, Chandler.
 39024—J. G. Hankins, Jiggs, Chevrolet.
 39025—H. Chas. Rawlings, Reno, Chandler.
 39026—Mrs. E. L. Marston, Reno, Locomobile.
 39027—Geo. Milner, Mason, Oldsmobile.
 39028—W. L. Dykes, Fallon, Ford.
 39029—J. M. Vance, Elko, Maxwell.
 39030—R. E. Ames, Elko, Hudson.
 39031—Ceko Madarieta, Elko, Oldsmobile.
 39032—A. W. Friberg, Fallon, Chevrolet.
 39033—Purity French Bakery, Reno, Ford.
 39034—M. L. Wallace, Reno, Ford.
 39035—Winnemucca Merc. Co., Ford.
 39036—C. True, Amos, Ford.
 39037—Josephine Lancirica, Amos, Reno.
 39038—James Humphrey, Reno, Franklin.
 39039—Geo. H. Bowler, Mesquite, Ford.
 39040—Mrs. E. Howell, Reno, Studebaker.
 39041—C. P. Stofall, Verdi, Overland.
 39042—Chas. C. Starr, Divide, Dodge.
 39043—Return Mining Co., Luning, Stutz.
 39044—Milo Wilkerson, Elko, Studebaker.
 39045—N. D. Steward, Goodsprings, Ford.
 39046—Anna Orloff, Reno, Maxwell.
 39047—Mrs. J. B. Goodwin, Silver Peak, Ford.
 39048—Frederick A. Vollmar, Reno, Franklin.
 39049—Robert M. Price, Reno, Pullman.
 39050—J. H. Crook, Bonnie Clare, Pullman.
 39051—J. F. Enkhouse, Reno, Reno.
 39052—Geo. C. Brodsgar, Reno, Chevrolet.
 39053—Mrs. Maasha Ratner, Reno, Ford.
 39054—Geo. Catlin, Vya, Ford.
 39055—Frank Chopping, Fallon, Vim.
 39056—C. C. Crone, Montello, Dodge.
 39057—Mrs. M. Samoville, Reno, Hupmobile.
 39058—Mrs. Edna P. Flagz, Reno, Hupmobile.
 39059—A. A. Gammon, Reno, Dodge.
 39060—Arthur Robinson, Ely, Ford.
 39061—H. Olinghouse, Pioche, Ford.
 39062—Geo. Foster, Reno, Ford.
 39063—Nev. Lailey Light Co., Reno, Ford.
 39064—G. N. Fish, Yerington, Ford.
 39065—Chas. M. Ward, Reno, Chevrolet.
 39066—J. B. Law, Verdi, Chevrolet.
 39067—Andrea Perazzo, Reno, Oldsmobile.
 39068—Jack Lowe, Sparks, Oldsmobile.
 39069—Wallace T. Whitney, Pioche, Ford.
 39070—Mike Delich, Ely, Elcar.
 39071—T. Mayeda, McGill, Ford.
 39072—Louis Mantel, Sparks, Ford.
 39073—David A. Snyder, Minden, Dodge.
 39074—Nev. Honey Bee M. Co., Lovelock, Ford.
 39075—Thos. J. D. Salter, Lovelock, Hudson.
 39076—Bert Mizer, Nelson, Hudson.
 39077—W. A. Clark, Reno, Ford.
 39078—Fred L. Potter, Reno, Ford.
 39079—Geo. Dalton, Fallon, Dodge.
 39080—Larry G. Bentz, Lovelock, Ford.
 39081—J. R. Watson, Sparks, Lexington.
 39082—W. N. Higgins, Reno, Oakland.
 39083—F. E. Crawford, Fallon, Ford.
 39084—Chester Ancker, Lovelock, Chalmers.
 39085—Douglas School District, Carson, Ford.
 39086—Mrs. Chas. Hobbins, Reno, Oldsmobile.
 39087—J. Jensen, Verdi, Lexington.
 39088—E. W. Belford, Mina, Chevrolet.
 39089—Highway Dept., Carson City.
 39090—Highway Dept., Carson City.
 39091—Highway Dept., Carson City.
 39092—Highway Dept., Carson City.
 39093—Highway Dept., Carson City.
 39094—Highway Dept., Carson City.
 39095—E. R. and F. R. Dodge, Reno, Ford.
 39096—E. A. Andrews, Jarbidge, Hupmobile.
 39097—Joe R. Sousa, Reno, Saxon.
 39098—Geo. E. Bamberger, Reno, Overland.
 39099—H. H. Stewart, Las Vegas, Ford.
 39100—C. H. Wise, Yerington, Ford.
 39101—C. H. Baker, Lovelock, Ford.
 39102—S. B. Elbert, East Ely, Franklin.
 39103—W. T. Deane, Hawthorne, Mercer.
 39104—C. P. McNew, Lamolle, Chevrolet.
 39105—Harry A. Van Ermen, Reno, Hudson.
 39106—Frank Lushbaugh, Reno, Hupmobile.
 39107—O. S. Day, Reno, Ford.
 39108—D. B. Halderman, Reno, Ford.
 39109—R. E. Shaffer, Carson City, Howard.
 39110—Jane Sutherland, Hazen, Ford.
 39111—L. Lavagnino, Reno, Ford.
 39112—D. P. Maestretti, Austin, Oakland.
 39113—C. R. Myers, Ruby Valley, Studebaker.
 39114—A. L. Parker, Ely, Ford.
 39115—F. E. Lauten, Reno, Ford.
 39116—Thomas C. Haley, Reno, Ford.
 39117—Geo. Fay, Sheridan, Buick.
 39118—T. G. Nichol, Wabuska, Ford.
 39119—Yerington Elec. Co., Yerington, Ford.
 39120—Arthur Gibson, Wonder, Ford.
 39121—T. E. Frederick, Reno, Stutz.

Dealers' Licenses and Motorcycle Licenses on next page.

LIST OF DEALERS' LICENSES FOR QUARTER ENDING SEPTEMBER 30, 1919

Make of vehicle is given last.

D-5549—Nevada Cadillac Co., Reno.....Cadillac.

LIST OF MOTORCYCLE LICENSES FOR QUARTER END- ING SEPTEMBER 30, 1919

Make of vehicle is given last.

<p>1102—Noel Arnold, Reno, Harley-Davidson. 1103—Carl Loorz, Lovelock, Indian. 1104—John R. Bryan, Reno, Indian. 1105—Tony Pecetti, Reno, Harley-Davidson. 1106—B. Bussemaker, Minden, Harley-Dav. 1107—W. C. McConnell, Reno, Indian. 1108—Theo. Ascargorta, Berlin, Indian. 1109—Peter Florentino, Yerington, Har.-Dav. 1110—P. A. Sample, Reno, Indian. 1111—Jas. R. Harmon, Reno, Indian. 1112—Frank Thrasher, Reno, Indian.</p>	<p>1113—R. H. Roberts, Wells, Indian. 1114—A. H. Randall, Dayton, Indian. 1115—Marion W. Magruder, Las Vegas, H-Dav. 1116—LeRoy Loyd, Reno, Indian. 1117—Standard Oil Co., Reno, Indian. 1118—Paul Bigsby, Reno, Indian. 1119—Clarence Heitman, Gardnerville, De Luxe 1120—Lloyd Wyatt, Genoa, Excelsior. 1121—Edward Mayo, Reno, Indian. 1122—Clark Oldfield, Ely, Indian.</p>
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STATE OF NEVADA

List of Registered Automobiles and Motorcycles from Oct. 1 to Dec. 31, 1919

FOURTH QUARTERLY REPORT

Compiled by
GEORGE BRODIGAN
Secretary of State of the State of Nevada



CARSON CITY, NEVADA

STATE PRINTING OFFICE : : JOE FARNSWORTH, SUPERINTENDENT
1919

FOURTH QUARTERLY REPORT OF REGISTERED AUTOMOBILES AND MOTORCYCLES

(Compiled by GEORGE BRODIGAN)

The following pages, compiled in numerical rotation, contain names and addresses of owners who have registered their motor vehicles for the year 1919 with the Secretary of State from October 1, 1919, to December 31, 1919, inclusive, together with the number of the official license-plate issued to each for use as prescribed by law.

This form was adopted at request of some of the officials whose duties include the enforcement of the motor-vehicle laws.

LIST OF REGISTERED AUTOMOBILES FOR QUARTER ENDING DECEMBER 31, 1919

Make of vehicle is given last.

3912—Austin Nevada Con. M. Co., Austin, Ford.	39196—Gabriel LeBall, Fallon, Maxwell.
3913—John Desmond, Tonopah, Chevrolet.	39197—L. H. Nobles, Reno, Ford.
3914—O. B. Gefeke, Gardnerville, International.	39198—D. H. Butler, Tonopah, Reo.
3915—Ed. Haller, Lucky Boy, Ford.	39199—Frank W. Orr, Reno, Chevrolet.
3916—Tom Balma, Las Vegas, Maxwell.	39200—Jim Hawkins, Genoa, Ford.
3917—Leo N. King, Carlin, Oakland.	39201—H. M. Bascom, Reno, Ford.
3918—E. T. George, Battle Mountain, Hupmobile.	39202—J. S. Amsden, Pioche, Paige-Detroit.
3919—F. C. Springmeyer, Gardnerville, Chandler.	39203—General Cameras Corp., Sparks, Buick.
3920—Albert Schragle, Gardnerville, Ford.	39204—Sam Selve, Tecopa, Cal., Ford.
3921—G. W. Hill, Elko, Studebaker.	39205—J. E. Williams, Lee, Buick.
3922—Hugh Sutherland, Tonopah, Buick.	39206—J. A. Prior, Gerlach, Chevrolet.
3923—H. D. King, Tonopah, Dodge.	39207—C. E. Matthews, Reno, Ford.
3924—John G. Terkla, Tonopah, Buick.	39208—G. U. Hall, Winnemucca, Ford.
3925—Gold Canyon Dredging Co., Dayton, Kleiber.	39209—E. Reinhart Co., Winnemucca, Dodge.
3926—James Regan, Mound House, Ford.	39210—J. W. Weniger, Red House, Ford.
3927—Reno Power, Light & Water Co., Reno, Dodge.	39211—Wm. B. Fitzgerald, Rawhide, Ford.
3928—Newton E. Potter, Reno, Ford.	39212—Mrs. Alice L. Perry, Vya, Dodge.
3929—State Engineer's office, Carson City, Ford.	39213—Ralph A. Jones, Sparks, Overland.
3930—H. L. Woodhouse, Reno, Hudson.	39214—J. A. Frederickson, Goodsprings, Ford.
3931—W. F. Browder, Fallon, Ford.	39215—Joa. E. Simpson, Goldfield, Moreland.
3932—Joe Anasabe, McDermitt, Ford.	39216—Geo. R. Emery, Sparks, Maxwell.
3933—C. B. French, Tonopah, Ford.	39217—Chris Thensen, Verdi, Ford.
3934—D. S. Thompson, Yerington, Reo.	39218—J. D. Van Fleet, Pioche, Ford.
3935—Margaret E. Tucker, Tonopah, Reo.	39219—J. F. Klaner, Elko, Ford.
3936—E. K. Hull, Las Vegas, Ford.	39220—C. E. Mills, Goldfield, Ford.
3937—Wm. Lichtenberg, Tonopah, Ford.	39221—Mrs. Elmer Johnson, Las Vegas, Chevrolet.
3938—S. B. Thornton, Fallon, Ford.	39222—Henry M. Hoyt, Reno, Hudson.
3939—Mrs. H. N. Denny, Reno, Ford.	39223—Frank E. Barker, Carson City, Ford.
3940—Rheiny Tank, Carlin, Studebaker.	39224—Wm. H. Doyle, Reno, Nash.
3941—W. J. Groh, Reno, Ford.	39225—Con. Spanish Belt S. M. Co., Tonopah, Duplex.
3942—F. W. Draper, Tonopah, National.	39226—S. A. Talbot, Mason, Overland.
3943—Louisiana Con. M. Co., Tonopah, Duplex.	39227—Ed. Christiernson, Junco, Ford.
3944—Louisiana Con. M. Co., Tonopah, Duplex.	39228—Blanche Shuman, Reno, Cadillac.
3945—Louisiana Con. M. Co., Tonopah, Duplex.	39229—Bruce Steward, Vya, Oakland.
3946—Louisiana Con. M. Co., Tonopah, Duplex.	39230—R. F. Smith, Austin, Ford.
3947—C. N. Miller & Co., Tonopah, Dodge.	39231—O. W. Fort, Elko, Buick.
3948—D. N. Elder, Fernley, Ford.	39232—A. B. Nichols, Fallon, Briscoe.
3949—A. F. Ramelli, Reno, Ford.	39233—Department of Interior, Fallon, Dodge.
3950—Wm. F. Rendant, Goldfield, Ford.	39234—Consumers Mutual Union, Reno, Ford.
3951—W. T. Moran, Virginia City, Chevrolet.	39235—Charles S. Mook, Carson City, Chevrolet.
3952—Sparks Grocery, Sparks, Ford.	39236—G. Rossi, Lamolille, Dodge.
3953—Thos. R. Mahan, Cherry Creek, Hupmobile.	39237—M. A. Moreira, Lovelock, Oakland.
3954—A. J. Hanson, Lovelock, Buick.	39238—Mary Avanzino, Reno, Reo.
3955—Frank Root, Fallon, Maxwell.	39239—Malcolm G. Malloy, Reno, Chandler.
3956—J. J. Silk, Las Vegas, Dodge.	39240—Harry G. Billington, Reno, Chandler.
3957—Associated Cleaners, Reno, Ford.	39241—Charles H. Abrams, Reno, Chandler.
3958—H. E. Kibble and H. Cook, Reno, Kleiber.	39242—George Christenson, Reno, Ford.
3959—Mrs. F. W. Schmailing, Fallon, Ford.	39243—H. P. McCormack, Sparks, Stutz.
3960—A. L. J. Clark, Las Vegas, Ford.	39244—I. Aronson, Reno, Republic.
3961—J. J. Cannon, Las Vegas, Dodge.	39245—Walter Carroll, Manhattan, Buick.
3962—O. Havendon, East Ely, Ford.	39246—J. P. Fitzgerald, Gardnerville, Buick.
3963—A. C. E. Bridger, Reno, Ford.	39247—See No. 39146 for description.
3964—M. J. Burr, Carson City, Chevrolet.	39248—Dana McGown, Reno, Ford.
3965—W. A. Hardy, Fernley, Ford.	39249—R. L. Goetz, Reno, Ford.
3966—C. M. Krummes, Gardnerville, Lorraine.	39250—L. G. Schuller, Lovelock, Overland.
3967—Mrs. L. L. Wheeler, Reno, Dodge.	39251—Wm. Wilson, Lovelock, Chevrolet.
3968—Thomas H. Stovell, Las Vegas, Buick.	39252—Ray Lester, Reno, Chevrolet.
3969—Kincart & Smith, Reno, Ford.	39253—H. O. Heiner, Reno, Chevrolet.
3970—Wood-Curtis Co., Tonopah, Ford.	39254—Standard Oil Company, Reno, Buick.
3971—Otto A. Riffel, Tonopah, Ford.	39255—Jones & Champion, Winnemucca, Reo.
3972—Nick Ableman, Tonopah, Hudson.	39256—H. A. Mathis, Winnemucca, Ford.
3973—J. Julian, Goldfield, Ford.	39257—R. G. Chichester, Smith, Buick.
3974—Mrs. H. P. Heehs, Reno, Ford.	39258—Nevada Valleys Power Co., Lovelock, Ford.
3975—Ward Bros., Reno, Ford.	39259—M. Bambauer, Luning, Buick.
3976—Ward Bros., Reno, Federal.	39260—H. E. Smith, Fallon, Chevrolet.
3977—R. C. Jensen, Reno, Dodge.	39261—Peter Smelcer, Reno, Chevrolet.
3978—Javan Mines Co., Contact, Ford.	39262—G. Crawford, Tonopah, Buick.
3979—Davis Oil Shale Refining Co., Reno, Overland.	39263—James L. Shute, Lovelock, Ford.
3980—W. Rittinger, Reno, Chevrolet.	39264—O. S. Hayes, Reno, Ford.
3981—W. E. Twist, Fernley, Chevrolet.	39265—W. M. Keeling, Tonopah, Ford.
3982—M. Mangrandi, Round Mountain, Dodge.	39266—O. E. Martin, Reno, Ford.
3983—H. R. Cooke, Tonopah, Oldsmobile.	39267—John G. Mihelitch, Tonopah, Ford.
3984—Highway Dept., Carson City, Ford.	39268—John D. Farwell, Sparks, Ford.
3985—Emmet Cahill, Fallon, Ford.	39269—Harry F. Brush, Sparks, Ford.

- 39270—R. C. Henderson, Flanigan, Chevrolet.
 39271—Elmer & Wm. Bennett, Sparks, Chevrolet.
 39272—Frank A. Strobls, Reno, Ford.
 39273—Fred B. Conkey, Sparks, Ford.
 39274—Elmer E. Preston, Sparks, Ford.
 39275—Dr. J. B. Wilson, Lovelock, Davis.
 39276—A. D. Geer, Alamo, Ford.
 39277—L. M. Christensen, Reno, Oakland.
 39278—C. M. Doty, Logandale, Ford.
 39279—W. F. Rendant, Goldfield, Ford.
 39280—B. F. Day, Fallon, Buick.
 39281—W. M. Keeling, Tonopah, Buick.
 39282—E. R. Stuver, Fallon, Chevrolet.
 39283—A. C. Arneson, Verdi, Chevrolet.
 39284—Abbie Louise Day, Reno, Chevrolet.
 39285—E. W. Owen, Reno, Ford.
 39286—H. C. Bath, Carson City, Chevrolet.
 39287—H. H. Manchester, Inlay, Maxwell-Palmer.
 39288—Chas. T. Spears, Goldfield, Ford.
 39289—C. Galbo, Elko, Overland.
 39290—C. J. McEwen, Carson City, Chevrolet.
 39291—Zamboni & Zent, Reno, Ford.
 39292—King & Malone, Elko, Buick.
 39293—Raleigh Samm, Yerington, Ford.
 39294—Adelaide Wyckoff, Las Vegas, Maxwell.
 39295—George Alton, Reno, Hudson.
 39296—G. M. Terry, Wellington, Chandler.
 39297—Nevada Valleys Power Co., Lovelock, Ford.
 39298—Clyde A. Garrett, Carson City, Ford.
 39299—Highways Dept., Carson City, Studebaker.
 39300—Emma L. Order, Carson City, Oldamobile.
 39301—D. O. Church, Winnemucca, Ford.
 39302—Fred A. Nelson, Fallon, Ford.
 39303—E. Kingman, Reno, Overland.
 39304—D. B. Frandsen, Reno, Chevrolet.
 39805—W. H. Braden, Goldfield, Ford.

LIST OF DEALERS' LICENSES FOR QUARTER ENDING DECEMBER 31, 1919

Make of vehicle is given last.

D-5548—Erie M. Gray, Carson City—Chevrolet, Maxwell, Chalmers.

LIST OF MOTORCYCLE LICENSES FOR QUARTER END- ING DECEMBER 31, 1919

Make of vehicle is given last.

1123—William Norris, Reno, Sears.
 1124—Jake Evans, Verdi, Indian.

1125—E. S. Lee, Las Vegas, Harley-Davidson.



**THE LAW REQUIRES THIS TO BE
POSTED IN EVERY SCHOOLROOM**

STATE OF NEVADA DEPARTMENT OF EDUCATION

Text- and Supplementary Books

ADOPTED BY STATE TEXT-BOOK COMMISSION, JUNE, 1919

A brief statement in regard to the adoptions made by the Nevada Text-Book Commission, June 17 to 21, 1919, is given to assist teachers in the selection of books where there are optional adoptions.

No Bookkeeping text was adopted for use in the hands of the pupils, as under the State Text-Book Commission law there is no authorization for the adoption of a text in this subject. However, since the School Code requires work in Business Forms and Elements of Bookkeeping and the teachers are therefore required to give this work, Schoch & Gross's "Elements of Business" (or some similar text) is to be furnished the teacher by each district as a basis for the work in the eighth grade. The revision of the Course of Study, to be issued within a few months, will give full details in regard to the plans for the work.

The Tarr-McMurry "New Geographies" are the adoptions for the coming year (1919-1920) on account of the unsettled conditions due to the war and the new United States census to come next year. Likewise, the present optional history adoption ("Mace's School History" and "Montgomery's Leading Facts in American History") is retained for another year on account of conditions due to the World War and the desire of the Commission to further investigate the best treatment of our national history from the newer viewpoint of subject-matter and emphasis. "On application to the State Board any school district of the State may be authorized to try out any text or texts in history classroom use approved by the State Board of Education."

In choice of the language series the State Text-Book Commission selected "Live Language Lessons" and "Oral and Written English" as the two best fitted for the needs of the schools in Nevada, with this expression of opinion: "It being the sense of the majority of the Commission that the 'Live Language Lessons' seem better fitted for the use of the rural schools." Any district has a free choice as to which of the two series is to be purchased for use in that school. This expression of judgment was made simply to aid rural schools in selecting a series.

The spelling texts offer a choice between the Pearson and Suzzallo "Essentials of Spelling" and "The New World Speller," both of which contain far less words than the "Hicks Champion Speller," which has been used for the past eight years. "The Hicks Champion Speller" contains about seven thousand words, "The New World Speller" about five thousand words, and "Pearson and Suzzallo" a little over three thousand. The latter is a one-book speller, to be used from the second to eighth grade, while "The New World Speller" is a three-book text, which does not reduce the word list as radically as the other text.

In making the adoption of method readers the State Text-Book Commission endeavored to offer a choice of methods without offering such a wide choice as would interfere with sound progress in the State. Similar action by other States offered a precedent that seemed worth considering. "The Beacon

Method" is retained so that those who have obtained satisfactory results in its use may continue this system. "The Natural Method Reader" uses the "story-approach" or analytic method, with the phonic system built on the family groups, as in the Gordon system used for the eight years previous to the adoption of the Beacon method. There is thus afforded to the teachers of the State the opportunity to select that method which appeals to each one as best suited in her judgment to secure strong results in reading, and there should come from this latitude afforded a distinct contribution to the best teaching of this most fundamental subject. Those who prefer the Gordon system of phonics can use the Gordon method with the Natural Method Readers, thus combining the "story-approach" and analytic method with the family group method of phonics.

PRICE-LIST OF TEXT-BOOKS

Gray, Reid, Wright Company, Reno, Nevada, is the State Depository.

Titles of books, and addresses of dealers	Price to school districts f. o. b.			Exch. price	
	Boston, Chicago, or New York	Reno	San Francisco	Old, with school district	New, with school district or dealers
ARITHMETIC					
Wentworth-Smith: Essentials of Arithmetic—					
Primary Book	\$0.81	\$0.38	\$0.34		
Intermediate Book	.38	.48	.88		
Advanced Book	.39	.47	.42		
<i>Ginn & Co., 20 Second St., San Francisco</i>					
For Supplementary Material, see Course of Study.					
Courts: Standard Practice Tests—					
Cabinet No. 1.	6.00	6.98			
Cabinet No. 2.	4.00	4.20			
Teacher's Manual	.35	.37			
Students' Record and Practice Pad	.12	.18			
<i>World Book Company, Yonkers, N. Y.</i>					
Felter: One Thousand Problems and Exercises in Arithmetic (see Course of Study)—					
Fifth Year	.184	.14			
Sixth Year	.184	.14			
Seventh Year	.184	.14			
Eighth Year	.184	.14			
<i>Silver, Burdett & Co., 565 Market St., San Francisco</i>					
BOOKKEEPING (See Course of Study)					
No text in the hands of the pupils.					
Schoch and Gross: Elements of Business (or similar text) in hands of teacher	.66	.80	.71		
<i>American Book Company, 565 Market St., San Francisco</i>					
DICTIONARIES					
Webster's Shorter School Dictionary	.54	.65	.58		
Webster's Elementary School Dictionary	.75	.90	.80		
Webster's Secondary School Dictionary	1.35	1.62	1.44		
<i>American Book Company, 565 Market St., San Francisco</i>					
DRAWING					
Industrial Art Text-Books (Regular Edition)—					
Part I	.224	.27			
Part II	.224	.27			
Part III	.224	.27			
Part IV	.224	.27			
Part V	.264	.32			
Part VI	.264	.32			
Part VII	.264	.32			
Part VIII	.264	.32			
<i>A. S. Barnes Company, 1922 Calumet Ave., Chicago, Ill.</i>					
For Supplementary Books, see Course of Study.					

PRICE-LIST OF TEXT-BOOKS—Continued

Titles of books, and addresses of dealers	Price to school districts f. o. b.			Exch. price	
	Boston, Chicago, or New York	Rene	San Francisco	Old, with school district	New, with school district or dealer
GEOGRAPHY					
Fairbanks: Home Geography for Primary Grades .....	.45	.54	.48	-----	-----
<i>Educational Publishing Co., 717 Market St., San Francisco</i>					
Tarr & McMurry: New Geographies—					
First Book .....	.54	.65	.58	-----	-----
Second Book .....	.98	1.12	1.00	-----	-----
<i>Mcmillan Co., 568-571 Market St., San Francisco</i>					
GRAMMAR —*Cobasal or Optional Adoption					
Either— (See Course of Study)					
Driggs: Live Language Lessons—					
First Book—Grades 3, 4 .....	.39	.47	-----	.44	Even
Second Book—Grades 5, 6 .....	.39	.47	-----	.44	Even
Third Book—Grades 7, 8 .....	.48	.58	-----	.55	Even
<i>University Publishing Company, Chicago, Ill.</i>					
Or—					
Jeckle: Beginner's Book in Language—Grade 3 .....	.36	.43	.38	.37	-----
Potter, Jeckle & Gillett: Oral and Written English—					
Book One—Grades 4, 5, 6 .....	.42	.50	.45	.44	-----
Book Two—Grades 7, 8 .....	.54	.65	.58	.56	-----
<i>Ginn & Co., 20 Second St., San Francisco</i>					
HISTORY (See Course of Study)					
NOTE—The State Text-Book Commission readopted the present History series for the next year pending further investigation of the best texts to meet the situation growing out of the World War and the newer viewpoint in the treatment of our national history. "On application to the State Board, any school district of the State may be authorized to try out any text or texts in history in classroom use approved by the State Board of Education."					
Mace: Primary History .....	.56	.67½	.63½	-----	-----
Mace-Tanner: Story of Old Europe and Young America .....	.56	.67½	.63½	-----	-----
<i>Rand, McNally & Co., Chicago, Ill.</i>					
Either— *Cobasal or Optional Adoption, as follows:					
Mace: School History .....	.82	.99	.98½	.93½	Even
<i>Rand, McNally & Co., Chicago, Ill.</i>					
Or—					
Montgomery: Leading Facts in American History, Revised Edition .....	.84	1.01	.90	.87	-----
<i>Ginn & Co., 20 Second St., San Francisco</i>					
MUSIC					
For Rural Schools—					
Myers: School Music Reader .....	.45	.54	.48	.51	Even
<i>For Town and City Schools. *Cobasal.</i>					
Either—					
Progressive Music Series—					
Book One .....	.27	.29	-----	-----	-----
Book Two .....	.30	.32	-----	-----	-----
Book Three .....	.33	.36	-----	-----	-----
Book Four .....	.48	.53	-----	-----	-----
Teacher's Manual, Vol. I .....	.90	.98	-----	-----	-----
Teacher's Manual, Vol. II .....	.90	.98	-----	-----	-----
Teacher's Manual, Vol. III .....	.90	.98	-----	-----	-----
<i>Silver, Burdett & Co., 565 Market St., San Francisco</i>					
Or—					
New Educational Music Course—					
First Reader .....	.27	.32	.29	.28	-----
Second Reader .....	.27	.32	.29	.28	-----
Third Reader .....	.33	.40	.35	.34	-----
Fourth Reader .....	.36	.43	.38	.37	-----
Fifth Reader .....	.45	.54	.48	.47	-----
<i>Ginn & Co., 20 Second St., San Francisco</i>					

*See explanatory note on page 5.

PRICE-LIST OF TEXT-BOOKS—Continued

Titles of books, and addresses of dealers	Price to school districts f. o. b.			Exch. price	
	Boston, Chicago, or New York	Reno	San Francisco	Old with school district	New with school district or dealer
PHYSIOLOGY —*Cobasal or Optional Adoption					
Richie-Caldwell: New Primer of Hygiene (To be purchased by districts for all elementary teachers in lower grades)	.39	.468			
Either—					
Richie: Sanitation and Physiology	.75	.90			
World Book Company, Yonkers, N. Y.					
Or—					
Jewett: The Body and Its Defenses	.57	.68	.61	.59	
Ginn & Co., 20 Second St., San Francisco					
NOTE—The "New Sanitation and Physiology" should be secured where texts are being purchased for an entire class. But where "Sanitation and Physiology" (the old edition) is in use and a few additional copies are needed, "Sanitation and Physiology" should be purchased and not the New Edition, as otherwise two different editions would be in use in the same class.					
READING —*Optional adoption					
(a) Method Readers—					
Either—					
Beacon Primer	.27	.32	.29		
Beacon First Reader	.27	.32	.29		
Beacon Second Reader	.31	.38	.34		
Beacon Third Reader	.42	.50	.45		
Beacon Fourth Reader	.54	.65	.58	.55	
Beacon Fifth Reader	.54	.65	.58	.55	
Beacon Phonetic Chart, Beacon Reading Chart and Holder (two charts and holder in one package each of Letter and Perception Cards)	4.50	5.40	4.80		
NOTE—The Phonetic Chart, the Reading Chart, Holder, and Cards may be bought separately at proportionate prices. See 1917 Course of Study.					
Ginn & Co., 20 Second St., San Francisco					
Or—					
Natural Method Readers:					
Primer	.24	.29	.26	.25	
First Reader	.28	.33	.30	.29	
Second Reader	.33	.40	.35	.34	
Third Reader	.38	.45	.40	.39	
Fourth Reader	.42	.50	.45	.44	
Fifth Reader	.48	.58	.51	.50	
Teacher's Manual	.42	.50	.45		
Word Cards for Primer	.84	1.01	.90		
Phonic Cards for Primer	.75	.90	.80		
Phonic Cards for First Reader	.72	.87	.77		
Phonic Cards for Second Reader	.84	1.01	.90		
Rhyme Cards	.45	.54	.48		
Sentence Cards	1.13	1.35	1.20		
Phrase Cards	.56	.68	.60		
Charles Scribner's Sons, 597-599 Fifth Ave., New York					
(b) Content Readers (one or more of the following series)—					
Edson-Laing Readers:					
Book I		.40		.32	
Book II		.44		.35	
Book III		.48		.39	
Book IV		.56		.45	
Book V		.68		.55	
Benj. H. Sanborn & Co., 623 S. Wabash Ave., Chicago, Ill.					
Holton-Curry Readers:					
First Reader	.30	.36	.34	.34	Even
Second Reader	.33	.40	.38	.38	Even
Third Reader	.37	.45	.42	.42	Even
Fourth Reader	.41	.49	.46	.46	Even
Fifth Reader	.45	.54	.51	.51	Even
Curry: Literary Readings (for Seventh and Eighth Grades)	.60	.72	.68	.68	Even
Rand, McNally & Co., Chicago, Ill.					

See explanatory note, page 5.

PRICE-LIST OF TEXT-BOOKS—Continued

Titles of books, and addresses of dealers	Price to school districts f. o. b.			Exch. price	
	Boston, Chicago, or New York	Reno	San Francisco	Old with school district	New with school district or dealer
Reading—Continued					
Searson-Martin-Tinley: Studies in Reading—					
Fifth Grade Reader.....	.42	.50	-----	.48	Even
Sixth Grade Reader.....	.42	.50	-----	.48	Even
Seventh Grade Reader.....	.45	.54	-----	.51	Even
Eighth Grade Reader.....	.48	.58	-----	.55	Even
<i>University Publishing Co., Chicago, Ill.</i>					
Standard Classic Readers—					
Fifth Year.....	.34	.41	.36	.39	Even
Sixth Year.....	.38	.45	.40	.42	Even
Seventh Year.....	.45	.54	.48	.51	Even
Eighth Year.....	.45	.54	.48	.51	Even
<i>Educational Publishing Co., 717 Market St., San Francisco</i>					
Or—					
Either of the series of Method Readers above not used					
as <i>Basal Method</i> readers may be used as Content					
readers.					
SPELLING—*Cobasal or Optional Adoption					
Either—					
Pearson-Suzzallo: Essentials of Spelling, Complete.....	.30	.36	.32	.34	Even
<i>American Book Co., 565 Market St., San Francisco</i>					
Or—					
Wohlfarth-Rogers: New World Speller—					
First Book—Grades 1, 2, 3.....	.30	.36	-----	.28	.34
Second Book—Grades 4, 5, 6.....	.30	.36	-----	.28	.34
Third Book—Grades 7, 8.....	.30	.36	-----	.28	.34
Teacher's Manual.....	.12	.144	-----		
<i>World Book Co., Yonkers, New York</i>					
WRITING					
Palmer: Writing Lessons for Primary Grades.....	.10	.12	-----		
Palmer: Method of Business Writing.....	.16	.19	-----		
<i>A. N. Palmer Company, Cedar Rapids, Iowa</i>					

*A Cobasal or Optional adoption gives a choice of one of two books adopted, as in Physiology, or one of two series of books, as in the case of the *Beacon* and *Natural Method* Readers. Only one book, or only one series of books, is required, and an option or choice as to the one preferred is thus given.

SUPPLEMENTARY AND LIBRARY BOOKS

At the present time (August, 1919) the following book companies maintain depositories in San Francisco:

Allyn & Bacon, 143 Second Street.
 American Book Company, 121 Second Street.
 Milton Bradley Company, 20 Second Street.
 Educational Publishing Company, 717 Market Street.
 Ginn & Co., 20 Second Street.
 Gregg Publishing Company, Phelan Building.
 The Macmillan Company, 609 Mission Street.

Potter Brothers Company, 571 Market Street, is the San Francisco depository for the following publishers:

Atkinson, Mentzger & Co.
 Barnes, A. S., & Co.
 Educational Publishing Company.
 Gregg Publishing Company.
 Heath, D. C., & Co.
 Holt, Henry & Co.
 Houghton Mifflin Company.
 Little, Brown & Co.
 Longmans, Green & Co.

Newson & Co.
 Rand, McNally & Co.
 Row, Peterson & Co.
 Sanborn, Benj. H., & Co.
 Scribner's, Charles, Sons.
 Scott Foresman Company.
 Silver, Burdett & Co.
 World Book Company.

Retail prices are quoted on most of the supplementary and library books herein listed. These prices are subject to discount when books are purchased in quantities, and owing to unsettled conditions prices are subject to change without notice.

NOTE—The names of publishing companies are abbreviated as follows:

A. B. Co.—American Book Company.
 A. M. & Co.—Atkinson, Mentzger & Co.
 B. Co.—A. S. Barnes & Co.
 B. & S.—P. Blakiston & Son.
 B. H. S. & Co.—Benj. H. Sanborn & Co.
 C. S. Co.—Capital Supply Company.
 Ed. Pub. Co.—Educational Publishing Company.
 G. & Co.—Ginn & Co.
 D. C. H. & Co.—D. C. Heath & Co.
 H. W. Co.—Harr Wagner Publishing Company.
 H. M. Co.—Houghton Mifflin Company.
 L. B. & Co.—Little, Brown & Co.
 M.—Macmillan Company.
 R. McN. & Co.—Rand, McNally & Co.
 R. P. & Co.—Row, Peterson & Co.
 S. & S.—Charles Scribner's Sons.
 S. B. & Co.—Silver, Burdett & Co.
 U. Pub. Co.—University Publishing Company.
 W. B. Co.—World Book Company.

Supplementary Readers

Everyday Classics (Third to Eighth Reader, inclusive), by Baker and Thorndike: M.

The Story Hour (Primer and Three Books): A. B. Co.

Reading Literature Readers, by Free and Treadwell (Primer and Eight Books): R. P. & Co.

Golden Rule Readers (Six Books): M.

History Stories of Other Lands, by Arthur Guy Perry (Six Books): R. P. & Co.

Progressive Road to Reading (Seven Books): S. B. & Co.

Holton-Curry Readers (Primer and Eight Books): R. McN. & Co.

American School Readers (Primer and Six Books): M.

New Sloan Readers (Primer and Two Readers): M.

Edsen-Laing Reader (Book V): B. H. S. & Co.

Gordon Readers (Five Books): D. C. H. & Co.

Riverside Readers, by Van Sickle and Seegmiller (Primer and Eight Books): H. M. Co.

Golden Treasury Readers, by Stebbins and Coolridge (Primer and Five Books): A. B. Co.

Story Readers, White's (Primer and First Reader): W. B. Co.

Wide Awake Readers, by Clara Murray (Primer and Four Books): L. B. & Co.

Wooster Readers, by Lizzie E. Wooster (Primer and Five Books): Wooster & Co.

Baldwin & Bender Readers (Five Books): A. B. Co.

Aldine Readers, by Spaulding and Bryce (Primer and Five Books): Newson & Co.

Children's Classics in Dramatic Form, by Augusta Stevenson (Four Books): H. M. Co.

Heath Readers (Eight Books): D. C. H. & Co.

Jones Readers (Five Books): G. & Co.

Blodgett Readers (Primer and Five Books): G. & Co.

Brooks Readers (Five Books): A. B. Co.

The Home and County Readers, Books I to IV, suitable for intermediate and upper grades: L. B. & Co.

The Halliburton Readers (Primer and Five Books): D. C. H. & Co.

Stepping Stones to Literature, by Arnold and Gilbert (Five Books): S. B. & Co.

Child Life Readers, by E. A. & M. F. Blaisdell (Primer and Five Books): M.

Sprague's Classic Readers (Five Books): Ed. Pub. Co.

FIRST GRADE

Parmly First Reader. 36c. A. B. Co.
Young and Field Literary Readers, Book I. 36c. G. & Co.
Searson, Martin, Tinley First Grade Readers. 36c. U. Pub. Co.
New Barnes Readers, by Robbins, Dressel & Graff. 33c. B. Co.
Story Hour Primer. 30c.
Story Hour Reader, Book I. 30c.
Laurel Primer. 30c. Laurel Book Co.
Reading Literature Primer, by Free & Treadwell. 32c.
Reading Literature, First Reader, by Free & Treadwell. 36c.
Progressive Road to Reading, Book I. 32c.
Holton Primer. 25c.
Holton-Curry First Reader. 30c.
American School Primer. 30c.
American School First Reader. 30c.
New Sloan Primer. 25c.
New Sloan First Reader. 30c.
White's Story Reader Primer. 30c.
White's Story Reader, First Year. 35c.
Eureka Primer. 30c. Ed. Pub. Co.
Eureka First Reader. 30c. Ed. Pub. Co.
Story Primer, by Ferrell & Puckett. 30c. Ed. Pub. Co.
Gordon's First Reader. 30c.
Riverside Primer. 30c.
Riverside First Reader. 35c.
Golden Treasure Primer. 32c.
Golden Treasure First Reader. 32c.
Wide Awake Primer. 30c.
Wide Awake First Reader. 30c.
Wooster Primer. 25c.
Wooster First Reader. 25c.
Baldwin & Bender First Reader. 30c.
Aldine Primer. 36c.
Aldine First Reader. 36c.
Heath's Reader, Book I. 25c.
Jones's First Reader. 30c.
Blodgett's First Reader. 30c.
Brooks's First Reader. 35c.
Stepping Stones, A First Reader. 30c.
Child Life First Reader. 25c.
The Halliburton Primer. D. C. H. & Co.
The Halliburton First Reader. D. C. H. & Co.

SECOND GRADE

Parmly Second Reader. 44c. A. B. Co.
Young and Field Literary Reader, Book II. 40c. G. & Co.
Searson, Martin, Tinley Second Reader. 41c. U. Pub. Co.
New Barnes Readers, by Robbins, Dressel and Graff. 44c. B. Co.
Story Hour Reader, Book II. 35c.
Reading Literature Second Reader, by Free & Treadwell. 40c.
Progressive Road to Reading, Book II. 40c.
Holton-Curry Second Reader. 35c.
American School Second Reader. 35c.
New Sloan Second Reader. 35c.
Gordon's Second Reader. 30c.
Gordon's Third Reader. 40c.
Riverside Second Reader. 40c.
Golden Treasure Second Reader. 32c.
Wide Awake Second Reader. 35c.
Wooster Second Reader. 30c.
Baldwin & Bender Second Reader. 35c.
Aldine Second Reader. 44c.
Children's Classics in Dramatic Form, Book I. 30c.
Heath's Reader, Book II. 30c.
Jones's Second Reader. 35c.
Blodgett's Second Reader. 35c.

Brooks's Second Reader. 35c.
 Stepping Stones, A Second Reader. 40c.
 Child Life in Tale and Fable Second Reader. 35c.
 Baker and Carpenter Second Year Language Reader. 30c.
 The Halliburton Second Reader. D. C. H. & Co.

THIRD GRADE

Baker and Thorndike Everyday Classics Third Reader. 52c. M.
 Parmly Third Reader. 44c. A. B. Co.
 Young and Field Literary Readers, Book III. 47c. G. & Co.
 Searson, Martin, Tinley Third Reader. 48c. U. Pub. Co.
 Greene's America First. 50c. S. B. & Co.
 Story Hour, Book III. 40c.
 Reading Literature Third Reader, by Free & Treadeww. 45.
 Golden Rule Reader, Golden Ladder Book. 40c.
 History Stories of Other Lands, Book I. 40c. R. P. & Co.
 Progressive Road to Reading, Introductory Book III. 42c.
 Progressive Road to Reading, Book III. 45c.
 Holton-Curry Third Reader. 40c.
 American School Third Reader. 40c.
 Stories of Famous Pictures, Book I. 40c. Ed. Pub. Co.
 Gordon's Fourth Reader. 50c.
 Riverside Third Reader. 50c.
 Golden Treasure Third Reader. 42c.
 Wide Awake Third Reader. 40c.
 Wooster Third Reader. 40c.
 Baldwin & Bender Third Reader. 45c.
 Aldine Third Reader. 52c.
 Children's Classics in Dramatic Form, Book II. 35c.
 Heath's Reader, Book III. 40c.
 Jones's Third Reader. 45c.
 Blodgett's Third Reader. 45c.
 Brooks's Third Reader. 40c.
 Stepping Stones, A Third Reader. 50c.
 Child Life in Many Lands, Third Reader. 36c.
 Baker & Carpenter Third Year Language Reader. 40c.
 Sprague's Classic Reader, Book III. 35c.
 Chamberlain's How We Are Fed. 40c. M.
 Chamberlain's How We Are Clothed. 40c. M.
 Andrews's Seven Little Sisters. 50c. G. & Co.
 Andrews's Each and All. 50c.
 The Halliburton Third Reader. D. C. H. & Co.
 Nature and Industry Readers: W. B. Co.
 Stories of Childhood and Nature.
 Stories of Woods and Fields.
 When the World Was Young.

FOURTH GRADE

Baker and Thorndike Everyday Classics Fourth Reader. 60c. M.
 Standard Classic Reader. 45c. Ed. Pub. Co.
 Young and Field Literary Readers, Book IV. 50c. G. & Co.
 Searson, Martin, Tinley Fourth Reader. 48c. U. Pub. Co.
 Greene's America First. 50c. S. B. & Co.
 Gordy's Our Patriots. 45c. S. B. & Co.
 Reading Literature Fourth Reader, by Free & Treadwell. 50c.
 Golden Rule Reader, Golden Path Book. 45c.
 History Stories of Other Lands, Book II. R. P. & Co.
 Progressive Road to Reading, Introductory Book IV. 48c.
 Progressive Road to Reading, Book IV. 50c.
 Holton-Curry Fourth Reader. 45c.
 American School Fourth Reader. 45c.
 Stories of the Rhine Country. 40c. Ed. Pub. Co.
 Stories of Famous Pictures, Book II. 40c. Ed. Pub. Co.
 Gordon's Fifth Reader. 55c.
 Riverside Fourth Reader. 55c.
 Wooster Fourth Reader. 50c.

Baldwin & Bender Reader for Fourth and Fifth Years. 55c.
 Aldine Fourth Reader. 68c.
 Children's Classics in Dramatic Form, Book III. 40c.
 Heath's Reader, Book IV. 40c.
 Jones's Fourth Reader. 45c.
 Blodgett's Fourth Reader. 65c.
 Brooks's Fourth Reader. 40c.
 Stepping Stones, A Fourth Reader. 60c.
 Child Life in Literature Fourth Reader. 40c.
 Baker & Carpenter Fourth Year Language Reader. 40c.
 Sprague's Classic Reader, Book IV. 60c.
 Chamberlain's How We Are Sheltered. 40c. M.
 Chamberlain's How We Travel. 40c. M.
 Hart's Colonial Children. 40c. M.
 The Haliburton Fourth Reader. D. C. H. & Co.
 Paz and Piablo. W. B. Co.
 Trees, Stars, and Birds, by Moseley. W. B. Co.

FIFTH GRADE

Baker and Thorndike Everyday Classics Fifth Reader. 64c. M.
 Young and Field Literary Reader, Book V. 58c. G. & Co.
 Greene's My Country's Voice. 45c. S. B. & Co.
 Edsen-Laing Fifth Reader. 54c.
 Reading Literature Fifth Reader, by Free & Treadwell. 55c.
 Golden Rule Reader, Golden Door Book. 50c.
 History Stories of Other Lands, Book III. 50c. R. P. & Co.
 Wheeler's Fifth Reader. 60c. W. H. Wheeler & Co.
 Progressive Road to Reading, Book V. 55c.
 Holton-Curry Fifth Reader. 50c.
 American School Fifth Reader. 50c.
 Riverside Fifth Reader. 55c.
 Wooster Fifth Reader. 60c.
 Baldwin & Bender Reader for Fourth and Fifth Years. 55c.
 Aldine Fifth Reader. 76c.
 Heath's Reader, Book V. 45c.
 Jones's Fifth Reader. 45c.
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1919

STATE OF NEVADA

ABSTRACT OF CLAIMS

TO THE

Waters of the Muddy River and Its Tributaries

Compiled by the Office of State Engineer, Under Authority of Chap.
140, Statutes of 1913, as Amended by Chap. 253, Statutes of 1915

J. G. SCRUGHAM, State Engineer



CARSON CITY, NEVADA

STATE PRINTING OFFICE : : : JOE FARNSWORTH, SUPERINTENDENT

1919



GENERAL STATEMENT

The following tabulation consists of a concise statement or abstract of the claim of each water user claiming an interest in and to the waters of the Muddy River and its tributaries in so far as the names of such water users could be ascertained. Such abstract is prepared pursuant to the provisions of chapter 140, Statutes of 1913, particularly section 28 thereof, as said chapter is amended by chapter 253, Statutes of 1915.

Particular attention is called to the accompanying notice and order of the State Engineer required by said section 28 as to the period during which, and the place where, the maps, plats, data and evidence heretofore collected by or filed with the State Engineer will be open for inspection by all parties, and as to the time during which contests may be filed, as provided by section 29, chapter 140, Statutes of 1913, as amended by chapter 253, Statutes of 1915.

J. G. SCRUGHAM,
State Engineer.

STATE OF NEVADA STATE ENGINEER'S OFFICE

I, J. G. Scrugham, State Engineer of the State of Nevada, duly appointed and qualified, having charge of the records and files of the office of the State Engineer, do hereby certify that the following is a full, complete, and true copy of an abstract of claims in and to the waters of the Muddy River and its tributaries prepared, and filed in said office on the twenty-second day of October, 1919, as appears by the records and files of the office of the State Engineer of Nevada, and nothing more or less.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my seal of office at the City of Carson, State of Nevada, this twenty-second day of October, A. D. 1919.

J. G. SCRUGHAM,
State Engineer.

[SEAL]

Claimant—Jacob Bloedel.

Source—Muddy River Tributary (Bloedel Spring).

<i>Ditch Title</i>	<i>Date when construction commenced</i>	<i>Date when land first irrigated</i>	<i>Number of acres irrigated</i>	<i>Sec.</i>	<i>Subdivision</i>	<i>Tp.</i>	<i>S.</i>	<i>R.</i>	<i>E.</i>
Morris & Jones Ditches.....	1896	1896 1908	2.00 2.00	22 21	NE½NE½ NE½NE½	14		65	
Total.....			4.00						

NOTES: Claims domestic use.

(Irrigation season January 1st to December 31st each year.)

Stipulated duty of water 1 c.f.s. to 70 acres.

Claimant—Moapa and Salt Lake Produce Co.

Source—Muddy River and Tributaries.

Big Spring, Jones Spring, High Spring, and Rock Cabin Spring Ditches.	14 15 15 16 16	W½SW½ S½ S½N½NW½ NE½ E½SE½	14 65
Excepting and excluding from above description the.....	16 16	NE½ NW½NE½ NW½ NE½NE½	14 65 14 65

NOTES: Domestic use claimed.

(Irrigation season April 1st to October 1st each year.)

Stipulated duty of water 1 c.f.s. to 70 acres.

Claimants—Isaiah Cox and Anna Cox, His Wife.

Source—Muddy River and Tributaries.

Cox Ditch and Cox Spring Ditch.	Prior to 1, 1905	10.00	16	NE½ NW½NE½	14	65
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NOTES: Domestic use claimed.

(Irrigation season April 1st to September 30th, inclusive, each year.)

Stipulated duty of water 1 c.f.s. to 70 acres.

Claimant—Isaiah Cox, for J. H. Mitchell.

Source—Muddy River.

Mowry & Mitchell or Cox Ditch..	About 1904	1904	3.00	16	NW½ NE½NE½	14	65
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NOTES: Right—Recorded in Clark County Recorder's office as 10 miners' inches for 10 acres.

All but 3 acres surrendered by nonuse of water.

(Irrigation season April 1st to October 1st each year.)

Stipulated duty of water 1 c.f.s. to 70 acres.

Claimant—George Baldwin.

Source—Muddy River and Tributaries.

George A. Davis and Dry Ditch..	1896-1897	Prior to 1905	25 25 36	SE½SW½ SW½SE½ Lots 2 and 3	14	65
			16.00	NE½	14	65

NOTES: Domestic use claimed.

(Irrigation season April 1st to October 1st each year.)

Stipulated duty of water 1 c.f.s. to 70 acres.

Claimant—U. S. Indian Service (Moapa Indian Reservation).

Source—Muddy River.

<i>Ditch Title</i>	<i>Date when construction commenced</i>	<i>Date when land first irrigated</i>	<i>Number of acres irrigated</i>	<i>Sec.</i>	<i>Subdivision</i>	<i>Tp.</i>	<i>S. R. E.</i>
Indian Ditches.....	Unknown	Unknown	87.00	34		14	65
				35		14	65
				31		14	66
				1		15	65
				6		15	66
Total			87.00				

Notes: The above data are all that are available in this office, and this is not to be construed as a claim made by the Indian Service.

The Indian Service has ignored the authority of the State Engineer's Office to adjudicate water claimed by the Indians.

Claimant—Sadie George.

Source—Muddy River and Tributaries.

Indian Ditch.....	Prior to 1905	Prior to 1905	2.10	1	SE½NE¼	15	65
Notes:	(Irrigation season April 1st to October 1st each year.)						
	Stipulated duty of water 1 c.f.s. to 70 acres.						

Claimant—Joseph Perkins.

Source—Muddy River and Tributaries.

Barnes & Harris Ditch and Bradfute Ditch.	Prior to 1890	Prior to 1905		6	Lots 4 and 5 NW¼	15	66
				6	Lot 6 SW¼		
				6	SE½NE¼		
				6	SW¼NE¼		
				6	Lots 2 and 3	15	66
			30.00				

Notes: Domestic use claimed.

(Irrigation season April 1st to October 1st each year.)

Stipulated duty of water 1 c.f.s. to 70 acres.

Claimant—Los Angeles and Salt Lake Ry. Co.

Source—Muddy River.

Pipe Line.....	1904	*1904	†3.25	32	NE¼	14	66
	*Date when water was first used. †Equivalent to number of acres irrigated.						

Notes: Water used for locomotives, cars, depot, stock yards, and town supply.

Pipe line never enlarged by claimant.

Amount of water diverted and beneficially used by Ry. Co. has been practically constant since 1904.

(Season January 1st to December 31st each year.)

Stipulated duty of water 1 c.f.s. to 70 acres.

Claimant—D. H. Livingston & Richard Smith.

Source—Muddy River and Tributaries.

White, Livingston, and Crosby Ditches.	Prior to 1905			5	S½SE¼	15	66
				8	N½NE¼		
				9	N½NW¼		
				9	NW¼NE¼		
				4	SW½SE¼		
				4	SE½SW¼		
			20.00	4	N½SE¼		
				9	NE½NE¼		
				4	SE½SE¼		
				3	W½SW¼		
				8	N½NW¼		
				5	S½SW¼	15	66
				6	S½SE¼ situated east of the R.R. track.		
Total			160.00				

Notes: Domestic use claimed.

(Irrigation season April 1st to October 1st each year.)

Stipulated duty of water 1 c.f.s. to 70 acres.

Claimant—G. S. Holmes & Julia May Knox.

Source—Muddy River and Tributaries.

<i>Ditch Title</i>	<i>Date when construction commenced</i>	<i>Date when land first irrigated</i>	<i>Number of acres irrigated</i>	<i>Sec.</i>	<i>Subdivision</i>	<i>Tp.</i>	<i>S.</i>	<i>R.</i>	<i>E.</i>
Weiser Ditch.....	1878 or thereabout	Prior to 1905		1	S $\frac{1}{2}$	15	66		
				1	NW $\frac{1}{4}$ SW $\frac{1}{4}$				
				1	S $\frac{1}{2}$				
				1	SW $\frac{1}{4}$ SW $\frac{1}{4}$				
				12	S $\frac{1}{2}$ SE $\frac{1}{4}$				
				12	NE $\frac{1}{4}$	15	66		
				12	NE $\frac{1}{4}$ SE $\frac{1}{4}$	15	66		
				7	SW $\frac{1}{4}$ NW $\frac{1}{4}$	15	67		
				7	NE $\frac{1}{4}$ SW $\frac{1}{4}$				
				7	Frac. $\frac{1}{4}$ SW $\frac{1}{4}$	15	67		

95.00

NOTES: (Irrigation season April 1st to October 1st each year.)

Stipulated duty of water 1 c.f.s. to 70 acres.

Claimant—W. J. Powers.

Source—Muddy River.

Cook Ditch.....	1896	1895	9.80	4	NW $\frac{1}{4}$ SE $\frac{1}{4}$	15	66
			5.70	4	NE $\frac{1}{4}$ SE $\frac{1}{4}$	15	66
		1897	6.00	4	NW $\frac{1}{4}$ SE $\frac{1}{4}$		
					NE $\frac{1}{4}$ SW $\frac{1}{4}$	15	66
		1902	5.70	4	NE $\frac{1}{4}$ SE $\frac{1}{4}$	15	66
		1902	0.40	4	SE $\frac{1}{4}$ NE $\frac{1}{4}$	15	66
		1902	2.90	3	NW $\frac{1}{4}$ SW $\frac{1}{4}$	15	66

NOTE: Total of 32.9 acres irrigated, but W. J. Powers compromised for 29 acres, provided 5 acres of water could be transferred to Logan and 24 acres used on ranch at Moapa. The 5 acres transferred to Logan would be used on Powers ranch at Logan, Nevada.

(Irrigation season January 1st to December 31st each year.)

Stipulated duty of water 1 c.f.s. to 70 acres.

Claimant—Muddy Valley Irrigation Co.

Source—Muddy River.

St. Joe Ditch.....	About 1866	Prior to 1905	20.00	15	SE $\frac{1}{4}$ SW $\frac{1}{4}$		
			14.00	15	SW $\frac{1}{4}$ SW $\frac{1}{4}$		
			34.00	15		15	67
			20.00	21	SE $\frac{1}{4}$ NE $\frac{1}{4}$		
			7.25	21	NE $\frac{1}{4}$ NE $\frac{1}{4}$		
			27.25	21		15	67
			20.00	22	NE $\frac{1}{4}$ NW $\frac{1}{4}$		
			24.00	22	SE $\frac{1}{4}$ NW $\frac{1}{4}$		
			14.00	22	NW $\frac{1}{4}$ NW $\frac{1}{4}$		
			14.00	22	SW $\frac{1}{4}$ NW $\frac{1}{4}$		
			14.00	22	NW $\frac{1}{4}$ SW $\frac{1}{4}$		
			14.00	22	NE $\frac{1}{4}$ SW $\frac{1}{4}$		
			15.00	22	SW $\frac{1}{4}$ SW $\frac{1}{4}$		
			20.00	22	NW $\frac{1}{4}$ NE $\frac{1}{4}$		
			20.00	22	SW $\frac{1}{4}$ NE $\frac{1}{4}$		
			15.00	22	NW $\frac{1}{4}$ SE $\frac{1}{4}$		
			14.00	22	SE $\frac{1}{4}$ SW $\frac{1}{4}$		
			184.00	22		15	67
			14.00	27	NE $\frac{1}{4}$ NW $\frac{1}{4}$		
			14.00	27	NW $\frac{1}{4}$ NE $\frac{1}{4}$		
			16.50	27	SW $\frac{1}{4}$ NE $\frac{1}{4}$		
			30.00	27	SE $\frac{1}{4}$ NE $\frac{1}{4}$		
			26.00	27	NE $\frac{1}{4}$ SE $\frac{1}{4}$		
			10.00	27	SE $\frac{1}{4}$ SE $\frac{1}{4}$		
			110.50	27		15	67
			2.60	26	SW $\frac{1}{4}$ NW $\frac{1}{4}$		
			24.40	26	NW $\frac{1}{4}$ SW $\frac{1}{4}$		
			8.00	26	SW $\frac{1}{4}$ SW $\frac{1}{4}$		
			30.00	26		15	67

MUDDY VALLEY IRRIGATION CO.—Continued.

<i>Ditch Title</i>	<i>Date when construction commenced</i>	<i>Date when land first irrigated</i>	<i>Number of acres irrigated</i>	<i>Sec.</i>	<i>Subdivision</i>	<i>Tr.S.</i>
St. Joe Ditch	About 1866	Prior to 1905	17.50 40.00 20.00	35 35 35	SE1NW1 NW1NW1 NE1NW1	
			77.50	35		15
Total			463.25			

Stipulated duty of water 1 c.f.s. to 70 acres.

Claimant—Muddy Valley Irrigation Co.

Source—Muddy River.

Sprole-Averitt	About 1888	Prior to 1905	22.25 25.00 10.00 35.50 22.50 28.00	27 27 27 27 27 27	NW1NW1 SW1NW1 SE1NW1 NE1SW1 SE1SW1 SW1SE1	
			143.25 6.00 15.00 17.75 40.00 13.75 6.50	27 34 34 34 34 34 34		15
			99.00	34		15
Total			242.25			

Stipulated duty of water 1 c.f.s. to 70 acres.

Claimant—Muddy Valley Irrigation Co.

Source—Muddy River.

Kapalapa Ditch	About 1866	Prior to 1905	10.00 20.00 20.00 20.00 7.50 20.00 20.00 20.00 20.00 20.00	2 2 2 2 2 2 2 2 2 2	NW1NW1 NE1NW1 SE1NW1 NW1NE1 NE1NE1 SE1NE1 SW1NE1 NW1SE1 NE1SW1	
			157.50	2		16

Stipulated duty of water 1 c.f.s. to 70 acres.

Claimant—Muddy Valley Irrigation Co.

Source—Muddy River.

Sparks Canal	About 1866	Prior to 1905	13.00 21.80 1.20	1 7 7	SE1SW1 SW1SW1 NW1SW1	16
			28.00 1.80 8.20	7 12 12		16
			10.00	12		16
Total			46.00			

Stipulated duty of water 1 c.f.s. to 70 acres.

Claimant—Muddy Valley Irrigation Co.

Source—Muddy River.

<i>Ditch Title</i>	<i>Date when construction commenced</i>	<i>Date when land first irrigated</i>	<i>Number of acres irrigated</i>	<i>Sec.</i>	<i>Subdivision</i>	<i>Tp.S. R.E.</i>
Overton Canal.....	About 1866	Prior to 1905	18.00	2	SW $\frac{1}{2}$ SE $\frac{1}{4}$	
			20.00	2	SE $\frac{1}{4}$ SW $\frac{1}{4}$	
			12.00	2	SW $\frac{1}{4}$ SW $\frac{1}{4}$	
			50.00	2		16 67
			7.00	3	SE $\frac{1}{4}$ SE $\frac{1}{4}$	16 67
			5.00	10	NE $\frac{1}{4}$ NE $\frac{1}{4}$	16 67
			10.00	11	NW $\frac{1}{4}$ NW $\frac{1}{4}$	
			20.00	11	NE $\frac{1}{4}$ NW $\frac{1}{4}$	
			20.00	11	NW $\frac{1}{4}$ NE $\frac{1}{4}$	
			13.475	11	NE $\frac{1}{4}$ NE $\frac{1}{4}$	
			7.50	11	SE $\frac{1}{4}$ NE $\frac{1}{4}$	
			7.50	11	SW $\frac{1}{4}$ NE $\frac{1}{4}$	
			10.00	11	NE $\frac{1}{4}$ SE $\frac{1}{4}$	
			10.00	11	NW $\frac{1}{4}$ SE $\frac{1}{4}$	
			27.525	11	SE $\frac{1}{4}$ SE $\frac{1}{4}$	
			126.00	11		16 67
			13.00	13	NW $\frac{1}{4}$ NW $\frac{1}{4}$	
			5.00	13	NE $\frac{1}{4}$ NW $\frac{1}{4}$	
			20.00	13	SW $\frac{1}{4}$ NW $\frac{1}{4}$	
			15.00	13	SE $\frac{1}{4}$ NW $\frac{1}{4}$	
			4.50	13	SW $\frac{1}{4}$ NE $\frac{1}{4}$	
			7.50	13	SE $\frac{1}{4}$ NE $\frac{1}{4}$	
			24.50	13	NW $\frac{1}{4}$ SE $\frac{1}{4}$	
			32.75	13	NE $\frac{1}{4}$ SE $\frac{1}{4}$	
			26.40	13	SE $\frac{1}{4}$ SE $\frac{1}{4}$	
			31.35	13	SW $\frac{1}{4}$ SE $\frac{1}{4}$	
			24.50	13	NE $\frac{1}{4}$ SW $\frac{1}{4}$	
			12.00	13	SE $\frac{1}{4}$ SW $\frac{1}{4}$	
			216.50	13		16 67
			7.50	14	NE $\frac{1}{4}$ NE $\frac{1}{4}$	16 67
			5.00	18	SW $\frac{1}{4}$ SW $\frac{1}{4}$	16 68
			3.00	19	SW $\frac{1}{4}$ SE $\frac{1}{4}$	
			6.00	19	NE $\frac{1}{4}$ SW $\frac{1}{4}$	
			5.00	19	SE $\frac{1}{4}$ SW $\frac{1}{4}$	
			14.00	19		16 68
			3.00	24	NW $\frac{1}{4}$ NE $\frac{1}{4}$	
			20.00	24	NE $\frac{1}{4}$ NE $\frac{1}{4}$	
			5.00	24	SW $\frac{1}{4}$ NE $\frac{1}{4}$	
			4.00	24	SE $\frac{1}{4}$ NE $\frac{1}{4}$	
			32.00	24		16 67
			3.00	30	NW $\frac{1}{4}$ NE $\frac{1}{4}$	16 68
Total.....			466.00			

Stipulated duty of water 1 c.f.s. to 70 acres.

Claimant—Muddy Valley Irrigation Co.

Source—Muddy River.

<i>Ditch Title</i>	<i>About 1866</i>	<i>Prior to 1905</i>				
Stringtown Ditch.....			17.80	12	NE $\frac{1}{4}$ NW $\frac{1}{4}$	
			12.50	12	SW $\frac{1}{4}$ NW $\frac{1}{4}$	
			12.50	12	SE $\frac{1}{4}$ NW $\frac{1}{4}$	
			7.50	12	SW $\frac{1}{4}$ NE $\frac{1}{4}$	
			12.00	12	NE $\frac{1}{4}$ SE $\frac{1}{4}$	
			30.00	12	NW $\frac{1}{4}$ SE $\frac{1}{4}$	
			36.20	12	SW $\frac{1}{4}$ SE $\frac{1}{4}$	
			24.10	12	SE $\frac{1}{4}$ SE $\frac{1}{4}$	
			7.00	12	NE $\frac{1}{4}$ SW $\frac{1}{4}$	
			15.00	12	SE $\frac{1}{4}$ SW $\frac{1}{4}$	
			3.00	12	SW $\frac{1}{4}$ SW $\frac{1}{4}$	
			182.60	12		16 67
			21.40	13	NW $\frac{1}{4}$ NE $\frac{1}{4}$	
			25.80	13	NE $\frac{1}{4}$ NE $\frac{1}{4}$	
			47.20	13		16 67

MUDDY VALLEY IRRIGATION CO.—Continued.

<i>Ditch Title</i>	<i>Date when construction commenced</i>	<i>Date when land first irrigated</i>	<i>Number of acres irrigated</i>	<i>Sec.</i>	<i>Subdivision</i>	<i>Tp.S. R.</i>
Stringtown Ditch.....	About 1866	Prior to 1905	5.00 5.00	18 18	SW $\frac{1}{4}$ NW $\frac{1}{4}$	
			10.00	18		16
Total			239.80			

Stipulated duty of water 1 c.f.s. to 70 acres.

**Claimant—Muddy Valley Irrigation Co.
Source—Muddy River.**

Koolin Ditch.....	About 1906	Prior to 1905	28.00	19	SE $\frac{1}{4}$ SE $\frac{1}{4}$	16
			20.00	30	SW $\frac{1}{4}$ NE $\frac{1}{4}$	
			20.00	30	NW $\frac{1}{4}$ SE $\frac{1}{4}$	
			7.00	30	NE $\frac{1}{4}$ NE $\frac{1}{4}$	
			47.00	30		16
			20.00	32	NE $\frac{1}{4}$ SE $\frac{1}{4}$	
			20.00	32	NW $\frac{1}{4}$ SE $\frac{1}{4}$	
			40.00	32		16
			4.00	29	NE $\frac{1}{4}$ NW $\frac{1}{4}$	16
Total			119.00			

Stipulated duty of water 1 c.f.s. to 70 acres.

**Claimant—Muddy Valley Irrigation Co.
Source—Muddy River.**

St. Thomas Ditch.....	About 1866	Prior to 1905	15.00	10	SE $\frac{1}{4}$ NW $\frac{1}{4}$	17
			20.05	10	NW $\frac{1}{4}$ NE $\frac{1}{4}$	
			19.00	10	NE $\frac{1}{4}$ NE $\frac{1}{4}$	
			23.00	10	SW $\frac{1}{4}$ NE $\frac{1}{4}$	
			13.50	10	SE $\frac{1}{4}$ NE $\frac{1}{4}$	
			17.25	10	NE $\frac{1}{4}$ SE $\frac{1}{4}$	
			2.50	10	SE $\frac{1}{4}$ SE $\frac{1}{4}$	
			110.30	10		17
			5.00	11	NW $\frac{1}{4}$ NW $\frac{1}{4}$	
			28.00	11	SW $\frac{1}{4}$ NW $\frac{1}{4}$	
			30.25	11	NW $\frac{1}{4}$ SW $\frac{1}{4}$	
			20.25	11	NE $\frac{1}{4}$ SW $\frac{1}{4}$	
			34.00	11	SW $\frac{1}{4}$ SW $\frac{1}{4}$	
			37.75	11	SE $\frac{1}{4}$ SW $\frac{1}{4}$	
			20.80	11	SW $\frac{1}{4}$ SE $\frac{1}{4}$	
			176.05	11		17
			17.80	14	NW $\frac{1}{4}$ NW $\frac{1}{4}$	
			37.00	14	NE $\frac{1}{4}$ NW $\frac{1}{4}$	
			25.20	14	NW $\frac{1}{4}$ NE $\frac{1}{4}$	
			24.20	14	NE $\frac{1}{4}$ NE $\frac{1}{4}$	
			10.50	14	SW $\frac{1}{4}$ NE $\frac{1}{4}$	
			19.40	14	SE $\frac{1}{4}$ NE $\frac{1}{4}$	
			184.10	14		17
Total			420.45			

Stipulated duty of water 1 c.f.s. to 70 acres.

**Claimant—John F. Perkins.
Source—Muddy River.**

St. Thomas Ditch.....	About 1872	1883	2.00	10	E part of NE $\frac{1}{4}$ SE $\frac{1}{4}$	
				11	W part of NW $\frac{1}{4}$ SW $\frac{1}{4}$	17

NOTE: Claims water for culinary and stock.

(Irrigation season January 1st to December 31st each year.)

Stipulated duty of water 1 c.f.s. to 70 acres.

Claimant—Muddy Valley Irrigation Co.

Source—Muddy River.

<i>Ditch Title</i>	<i>Date when construction commenced</i>	<i>Date when land first irrigated</i>	<i>Number of acres irrigated</i>	<i>Sec.</i>	<i>Subdivision</i>	<i>Tp.S.</i>	<i>R.E.</i>
East St. Thomas Ditch.....	About 1866	Prior to 1905	4.00	2	SW $\frac{1}{4}$ SW $\frac{1}{4}$	17	68
			17.00	8	SE $\frac{1}{4}$ SE $\frac{1}{4}$		
			7.00	8	NE $\frac{1}{4}$ SE $\frac{1}{4}$		
			24.00	8		17	68
			15.85	11	NW $\frac{1}{4}$ NW $\frac{1}{4}$		
			16.10	11	NE $\frac{1}{4}$ NW $\frac{1}{4}$		
			8.00	11	SW $\frac{1}{4}$ NW $\frac{1}{4}$		
			12.00	11	SE $\frac{1}{4}$ NW $\frac{1}{4}$		
			10.60	11	NW $\frac{1}{4}$ SE $\frac{1}{4}$		
			62.55	11		17	68
Total.....			90.55				

Stipulated duty of water 1 c.f.s. to 70 acres.

SUMMARY OF CLAIMS TO THE WATERS OF THE MUDDY RIVER SYSTEM

<i>Claimant</i>	<i>Acreage</i>	<i>c.f.s.</i>
Jacob Bloodel.....	4.00	4-70ths
Moapa and Salt Lake Produce Co.....	155.00	2 and 15-70ths
Isalah Cox and Anna Cox, his wife.....	10.00	10-70ths
Isalah Cox for J. H. Mitchell.....	3.00	3-70ths
George Baldwin.....	16.00	16-70ths
Sadie George.....	2.10	21-700ths
John F. Perkins.....	2.00	2-70ths
Los Angeles and Salt Lake Ry. Co.....	3.25 (equiv.)	325-7000ths
D. H. Livingston & Richard Smith.....	160.00	2 and 20-70ths
G. S. Holmes & Julia May Knox.....	95.00	1 and 25-70ths
W. J. Powers.....	29.00	29-70ths
*Muddy Valley Irrigation Co.:		
St. Joe Ditch.....	463.25	46325-7000ths
Sprole-Averitt Ditch.....	242.25	24225-7000ths
Kapalapa Ditch.....	157.50	15750-7000ths
Sparks Canal.....	46.00	46-70ths
Overton Canal.....	466.00	466-70ths
Stringtown Ditch.....	239.80	23980-7000ths
Kaolin Ditch.....	119.00	119-70ths
St. Thomas Ditch.....	420.45	42045-7000ths
East St. Thomas Ditch.....	90.55	9055-7000ths
Joseph Perkins.....	30.00	30-70ths
Total.....	2,754.15	275415-7000ths
*Total for Muddy Valley Irrigation Company.....	2,244.80	224480-7000ths
Moapa Indian Reservation (1905).....	87.00	1 and 17-70ths



Issued in Furtherance of the Act of May 8, 1914



UNIVERSITY OF NEVADA

25

RENO, NEVADA, 1919

WATER COST OF IRRIGATION

TRUCKEE VALLEY, NEVADA

A Study of the Factors Involved in the Problem of Water Duty—Computation of Mean Economic Head Required; The Loss from Evapo-Transpiration, and the Effect on River Discharge, in Time and Quantity, of Retarded Return Seepage—Influence of the Valley Lowlands in Increasing Water Loss—Analytic Computation of the Final Disposition of Water Applied in Irrigation in Quantities and Percentages.

By

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Director Agricultural Extension

CARSON CITY, NEVADA

STATE PRINTING OFFICE—JOE FARNSWORTH, SUPERINTENDENT

1919



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WATER COST OF IRRIGATION, TRUCKEE VALLEY, NEVADA

By

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Following is presented a study of the irrigation situation in the Truckee Valley, Nevada, in relation to the quantity of water applied, evaporation and transpiration loss, seepage return to the Truckee River channel, irrigation methods practiced, and the duty of water for the general area.

PART I comprises a general discussion of evaporation, evapotranspiration, irrigation methods, and other matters having a more or less direct bearing on the problem.

PART II gives the methods used in the several computations, the data upon which founded, and the quantitative results.

THE TRUCKEE VALLEY

For the purpose of the inquiry, the Truckee Valley is considered as embracing all the irrigated lands, swamps, and water surfaces in the general valley of the Truckee River between State Line, on the west; Steamboat, on the south; Vista on the east, and the north boundary of irrigated lands between Vista and State Line, inclusive of the area irrigated from the Truckee River in Spanish Springs Valley; estimated at 35,000 acres, of which 1,500 acres are swamp and water surfaces, leaving 33,500 acres, in round numbers, as the crop-producing area.

PART I

EVAPORATION

Evaporation occurs from water surfaces and the soil. The factors affecting evaporation are solar intensity, atmospheric humidity, and wind. In an arid climate evaporation is greater from a water surface and from the soil than in more humid regions. The evaporation ratio of one locality as compared with another is based on relative evaporation from a free water surface.

Free Water Surface Evaporation, Truckee Valley—The experiments of Peterson, Nevada Experiment Station, 1911-1912, are the most accurate data available concerning evaporation from a free water surface in the Truckee Valley.

TABLE I—*Evaporation from a Free Water Surface, Peterson's Experiments, Means for 1911-12*

Month	Inches	Relative per cent
January	1.21	10.6
February	1.72	15.1
March	1.32	11.6
April	3.47	30.4
May	8.08	70.8
June	10.42	91.2
July	11.31	99.8
August	11.41	100.0
September	8.51	74.8
October	4.94	43.3
November	2.23	19.6
December	1.79	15.7
Total	66.41	

These experiments were begun May 1, 1911, and continued to December 31, 1912. The figures for 1912 are usually given, showing a total of 64.28 inches annual evaporation. For June, July, and August the records show little variation between the two years, September, 1912; however, evaporation was but 7.29 inches, as compared with 9.73 inches in 1911, due to lower mean temperature and marked variation in wind miles. The eruption of Mount Katmi, Alaska, in June, 1912, produced an atmospheric haze the latter part of the summer which reduced solar intensity 20 per cent, as measured at the Mount Whitney observatory, and undoubtedly affected evaporation here. The means of the two years, as given, from May to December, inclusive, are probably very close to the actual evaporation means of the Truckee Valley; the means, January to April, are the 1912 records alone.

On Bare Soils Between Irrigations—Results of soil evaporation experiments are to be regarded, in respect to quantity of water evaporated, as true only for the given soil and the climatic conditions obtaining during the period of the test. All other conditions being the same, the factor of relative atmospheric humidity will modify experiments conducted at different places. Since the arid region has less humidity than elsewhere in the United States, and among the arid States Nevada has the least, we may generally assume that evaporation will be somewhat higher here than among the other arid States. Evaporation and transpiration results obtained outside the arid region have little signification here.

Different types of soils, such as sand, loam, clay, and their various admixtures, other conditions being the same, will give different evaporation results. Finally the depth and texture of the soil and the character of its drainage are factors influencing evaporation.

Widtsoe, Fortier, and others conducting experiments to determine the evaporation loss of water from typical soils in the arid region, between irrigations, obtained results substantially similar, when corrected by atmospheric conditions. Table II gives the average daily

loss of moisture in the Utah experiments, as estimated from the curve graphic, the period between irrigations being 21 days.

It will be noted from this table that 33.6% of the total evaporation during the 21-day period occurred during the first three days, and about 46% of this the first day. The rapidity diminishing evaporation between the first and fifth days is due to the deeper penetration and diffusion of the water in the soil. Also may be noted the gradually decreasing efficiency of capillarity in raising it to within reach of the evaporation factors.

TABLE II—*Evaporation from Bare Soils Between Irrigations*

<i>Days</i>	<i>Inches</i>
1.....	.41
2.....	.28
3.....	.22
4.....	.16
5.....	.13
6.....	.13
7.....	.12
8.....	.12
9.....	.12
10.....	.11
11.....	.11
12.....	.10
13.....	.10
14.....	.09
15.....	.09
16.....	.08
17.....	.08
18.....	.07
19.....	.07
20.....	.06
21.....	.06
Total.....	2.71

Table II is interesting in the fact that it affords some criterion of the relative loss of water by evaporation as affected by the frequency of irrigation on lands without crop covering.

Eight irrigations of 21 days each, covering a period of 168 days, would result in an evaporation loss of 21.68 inches. For 12 irrigations, 14 days apart, covering a like period, the loss would be 26.4 inches, or a 21.7% increase. For 14 irrigations, 12 days apart, the loss would be 28.14 inches.

Unfortunately data is not at hand as to the types of soils employed. In view of the purpose of the experiments, however, it is presumptive that they fairly represented the general run of soils found in Utah and Nevada. In actual field practice it seems probable that there would be some increase in evaporation over that shown in the experiments at the beginning of each irrigation due to the longer time of application. To apply six to eight inches of irrigation water to a field requires ordinarily from 12 to 24 hours, in which the upper part of the field is water-covered the entire time. The same depth applied to soil in a container would penetrate below the surface in a few hours

at most. Thus, in irrigation practice, we would have the equivalent of a free water surface for a considerable part of a day, and subject to maximum evaporation, as compared with a relatively short period under experimental conditions. The evaporation quantities in the table may therefore be regarded as probably under, rather than in excess, of field results.

Shading of soils from direct sunlight, but otherwise open to wind and atmospheric changes, diminishes evaporation about 25%. When covered with plant growth we not only have more or less shading but an interruption of air currents, such that evaporation is still further diminished. Offsetting such saving, however, is the transpiration of moisture by the crop which will be discussed later on.

Evaporation from Bare Soils of Undrained Lands—In like soils where the water table is within a foot to five or six feet below the surface, the evaporation of irrigation water applied at the surface will essentially be in some approximate inverse ratio to the depth of the water table. The downward gravitation of free water will be retarded for a greater or less time immediately above the subsurface water plane. The time required for its incorporation into the water table level will be proportional to the time necessary for the horizontal spread of the underground water to affect an equilibrium. The water table, as so temporarily elevated and at its equilibrium level, establishes limits to the distance which capillarity must needs lift moisture to be within reach of the factors of evaporation. With well-drained soils irrigation water penetrates downward to varying depths and diffuses itself gradually in the subsoil until a moisture equilibrium is established, the effect of which is gradually to diminish the efficiency of capillarity in raising it to the surface.

But, in soils with a high water table, the relative thinness of the soil blanket superimposed between the water table and the atmosphere affords, within certain limits, maximum opportunity for the lifting of moisture by capillarity to within reach of the factors of evaporation.

Unfortunately there appears to be no experimental data relating to evaporation losses from high-water-table soils between irrigations. The experiments of Sleight, at Denver, in 1916, are perhaps the nearest approximation of such conditions. These experiments were not for the purpose of determining losses of irrigation water applied upon the surface, but to ascertain the evaporation of subsurface water through soil blankets of different depths. The water table was kept constant at the test depth in each instance, no irrigation being applied at the surface. Evaporation losses were determined with exactness and are expressed in percentages of evaporation from a free water surface check, thus rendering them translatable in terms of other localities.

TABLE III—*Evaporation of subsurface water through Soil Blankets of Varying Thickness. Summary of Experiments of R. B. Sleight, Denver, Colo., 1916 (Expressed in Per Cent of Evaporation from a Water Surface)*

	Water Table Depth in Inches Below the Surface									
	3	4	6	12	16	24	28	38	43	50 ¹
Laboratory Soil.....		88.2			79.8		8.02	4.24	0.98	0.93
River Sand No. 10.....	69.0		64.5	57.7		11.3				
River Sand No. 11.....	70.0			59.6						
River Sand No. 12.....	77.0			69.8						

The Sleight experiments covered periods of two months and upwards, during which time no water was applied at the surface. Somewhere between 16 inches and 24 inches depth of soil blanket, it will be noted, the lento-capillary* moisture chain between the water table and the surface is broken, resulting in an abrupt decline in evaporation when the water table is below these depths. In irrigation practice, on soils with a water table below the maximum depth of continuous lento-capillary activity, say 20 inches with average soils, each irrigation essentially restores the chain of moisture ascension for varying periods; the relative length of which would be more or less inversely to the depth of the water table—within a range of perhaps five or six feet of water-table depth.

Note the material increase of evaporation from the "laboratory soil" as compared with screened sand of various fineness.

The former contained no organic matter. Its composition was 8.5% fine gravel and coarse sand, 59.8% medium to very fine sand, 15.8% silt, and 15.8% clay. Except for the omission of organic matter, it was not much different in general texture from the soils of the Truckee Valley bottom lands. Hence evaporation from it may be regarded as more nearly the gage of evaporation under like conditions on the Truckee Meadows than that from the sands, which were devoid of clay and silt.

In Table II, representing evaporation from well-drained soils, following an irrigation, we have a maximum evaporation the first day with a rapid decline during the succeeding three days and a fairly uniform diminishing quantity to the end of the period, due to the sinking of the moisture in the soil and the decreasing efficiency of capillary action. In the Sleight experiments we have an evaporation loss that is a constant for each depth of water table and each type of soil, other than as affected by purely atmospheric conditions.

If the "Laboratory Soil" used in the Sleight experiments was, as it seems to have been, fairly representative of the soils of the Truckee Meadows, we have only to apply the percentages for different depths of water table to the seasonal evaporation for this locality, given in

*Lento-capillarity defines a moisture content in the soil in which each particle is covered with a film of moisture. Soil moisture will crawl from one particle to another in contact with it, by adhesion, until the film becomes too thin for further extension—the pull of adhesion being less than the molecular cohesion of the water at such terminal point.

Table I, to ascertain the approximate evaporation from our high-water-table lands, *when unirrigated and not crop covered*. With a water table 16 inches below the surface this would be 51.31 inches per year, or 41.5 inches for the irrigation season May to September, inclusive, without the application of any surface water.

The water table in the 17,500 acres of meadow-grass lands in the Truckee Valley averages about 24 inches depth (see p. 24). The lands are irrigated for the most part at intervals of from 10 to 18 days, during the growing season, the effect of which, as hitherto described, is to continually restore lento-capillary action between the water table and the surface, aside from furnishing a new supply of moisture in the upper soil blanket. We may, therefore, conclude with considerable assurance that the evaporation from soils without crop covering on the Truckee Meadows, and which would include closely grazed pastures, is not less than 50 inches per annum and not far from 40 inches between May 1 and October 31.

EVAPOTRANSPIRATION

We come now to the consideration of lands on which there is a crop covering. Here evaporation will bear some continuing relation to the irrigation and water-table factors hitherto presented, but the soil will be shaded and the action of wind in increasing evaporation be materially diminished. The new factor entering the equation is plant transpiration.

Evapo-Transpiration Loss of Irrigation Water—The quantity of water which plants transpire (analogous to the perspiration of animals) is far greater than popularly understood. It is commonly expressed as pounds of water transpired by a given plant in producing a pound of dry matter called the "transpiration ratio." It varies widely among different plants. There is also wide variation in the transpiration of the same plant under varying conditions of soil, moisture and climate. The same climatic factors which cause high evaporation will likewise cause high transpiration. And in Nevada both evaporation and transpiration are well towards the maximum.

To determine the transpiration of a plant the soil about it is covered with wax to prevent evaporation and the loss of moisture measured. Transpiration, alone, is not of practical importance since, in the growing of any crop, more or less water is evaporated from the soil immediately about the plant. The term "evapo-transpiration" is therefore used to include both.

All evapo-transpiration experiments are essentially under laboratory conditions, in which field conditions are approximated as closely as possible. But inasmuch as every climatic and seasonal change and

every variation in soil and moisture is sensitively reflected in modifications of transpiration from the same plant, experimental results are to be regarded as approximate rather than actual.

Again, in experimentation, it is difficult precisely to duplicate field conditions in respect to those plants which grow thickly together, such as alfalfa. The tests are conducted in containers, usually about 30 inches in diameter and five or six feet depth of soil. It will be noted that the relative exposure of the plant surfaces to the atmosphere, *from the sides*, is materially greater than under field conditions, unless the containers are actually set in the ground within a field of the same crop, which has not always been done. I am persuaded that for such thickly growing plants, especially alfalfa, in those specific experiments where considerable moisture is applied, the evapo-transpiration ratio is higher than under actual field conditions. This is illustrated in Table IV, in the case of the evapo-transpiration of alfalfa under a 30- and 50-inches application of water as compared with lesser quantities. The results of the present investigation of the evapo-transpiration loss of water in the Truckee Valley seems clearly to indicate a much lower evapo-transpiration ratio for alfalfa in relation to quantity production.

The relative evapo-transpiration of different plants—a matter of great importance in dry-farming—may be very accurately determined when the experiments are conducted under like soil and climatic conditions. The work of Briggs and Shantz, at Akron, Colo., 1911-1915, supplies data of extreme value and interest in this respect. Their results in respect to alfalfa, when corrected by relative solar intensity and humidity are not materially different from that obtained by other investigators.

The most practical experimentation relating to the evapo-transpiration ratio of alfalfa was that of Widtsoe, at the Utah Experiment Station, 1909-1912, wherein different quantities of water were applied and the water loss per pound of dry matter obtained in each instance. His results are given in the first two columns of Table IV. The computation of these results in terms of yield per acre of dry matter and cured alfalfa were made by the writer, the proportion of dry matter in cured alfalfa being rated at 92%.

TABLE IV—*Evapo-Transpiration Loss of Water in Alfalfa Production (Adapted from Widtsoe's Experiments)*

<i>Inches Water Applied</i>	<i>Evapo-Transpira- tion Ratio</i>	<i>Acres Basis Production Pounds Dry Matter</i>	<i>Equivalent in Tons Alfalfa Hay</i>
10.....	621	3,647	2.00
15.....	977	4,608	2.50
20.....	946	4,883	2.65
25.....	1052	5,378	2.92
30.....	1253	5,431	2.95
50.....	1490	7,646	4.15

This table illustrates in part, quite clearly, the natural law of all plant life, namely: That between the wilting-point, minimum, and that of excess moisture, maximum, proportional to the quantity of crop produced per unit of water, all plants will conserve water according to its scarcity, transpire it with increasing freedom as the soil moisture increases and beyond some undetermined point, varying with different plants and the same plant under different conditions, will transpire wastefully.

The table further illustrates the natural law of plant life, that increasing crop production up to the given soil and climatic maximum can only be accompanied by the application of increasing quantities of water up to some point where further increase of water gives diminishing crop returns. The quantity of moisture expended per crop quantity will vary with different plants and with the same plant under different soil and climatic conditions.

It has been established by repeated experimentation that the moisture cost of a crop diminishes as soil fertility increases. On the other hand the evapo-transpiration ratio will increase from causes affecting plant vitality or thriftiness, such as a backward season, frosts, disease, insect pests, or permitting a plant at any early or intermediate stage of its growth to wilt from water scarcity followed by normal moisture.

The writer has been unable to find any data as to the evapo-transpiration ratio of meadow grasses, grown in high-water-table soils, or of tules, rushes and other marsh plants. It is a proper assumption, in view of the behavior of all other plants where excess moisture is available, that the relative ratio of these is far higher than for plants grown in soils of ordinary moisture content. —

WATER DUTY

The term "duty of water" means the quantity of water applied in irrigating a unit of land to produce a given crop. It is usually expressed in acre-feet or acre-inches. The less the quantity applied the higher the water duty, the greater the quantity the lower the water duty.

Quantity of Irrigation Water Required in Crop Production—The factors in this problem are (a) The Crop; (b) The Soil, in respect to its composition texture and drainage, and (c) The Climate. Given these three factors and it is not difficult to estimate with reasonable exactness the seasonal quantity of irrigation water necessary to produce a given crop yield.

The Crop Factor—The crop is a factor from the standpoint of its *relative* moisture requirements and the period, whether the whole season or only a part, that it must be irrigated, as well, also, the depth or shallowness of its root system.

Finally, the crop is a factor from another standpoint, namely, whether its growth involves surface cultivation, and the extent to which such cultivation may produce a mulch to decrease evaporation—or whether it is an uncultivated crop, such as alfalfa, meadow grasses, and the like, wherein the soil surface, other than as tramped by live stock, is to be regarded as in its natural state.

The Soil Factor—Only in rare instances have we any exact information concerning the soil's physical texture and the log of its strata for six or more feet in depth. Without such information there is no way of estimating, with any precision, the movement of irrigation water within the soil after its application at the surface; how rapidly and far it penetrates and diffuses itself in relation to the crop root-zone and the diminishing ratio of its evaporation due to downward penetration and diffusion. If the water table be high, we would have this additional factor to take into account.

It is well known that one field of similar soil fertility may require much more water than another to produce an equivalent crop, the extremes being from less than half an acre-foot to seven or eight acre-feet. Such variation is caused by soil composition, texture, strata, and drainage.

Irrigation water applied to a field, the soil of which is chiefly gravel and coarse sand, with a minimum of clay and loam, may pass into it as into a sieve, requiring frequent and large applications to maintain sufficient moisture in the root-zone to produce a successful crop. Here the major loss will be from excess seepage below the root-zone, while the evapo-transpiration loss may not be above normal.

Another field possesses a soil of fine texture, containing more or less clay and silt, in which irrigation water penetrates slowly, and little or none is lost by seepage below the root-zone. Evapo-transpiration may be much higher than on the gravelly soil, although the quantity of irrigation water necessary in many instances—but not always—may be markedly less. With this type of soils, evaporation will vary with the different effects of sun and winds on the surface—namely: the extent to which the soil is mulched by cultivation or self-mulches, thus interrupting capillarity and so reducing evaporation, and, on the other hand, the extent to which the surface may crust to afford the maximum opportunity for capillary action and evaporation. If the land is in an uncultivated crop such that no artificial or natural mulch checks evaporation, but on the other hand its tendency is to surface cake, the water duty in its irrigation may essentially be extremely low.

Finally, any soil where the water table is within influencing distance of the root-zone and of evaporation, as a rule, will show a maximum evapo-transpiration relative to the quantity of water applied or required for surface irrigation. In such instances evapo-transpiration

may exceed the irrigation water applied, the difference being subtracted from the water table. The quantity of surface irrigation necessary for successful crops on subirrigated lands growing shallow-rooted crops, such as meadow grasses, will depend upon (a) the distance below the surface of the water table, (b) the soil texture and log of the strata between, and (c) upon the behavior of the soil surface under sun and wind in respect to mulching or caking. It is not uncommon to find meadow grasses withering from drought, because of surface caking, with a water table near the surface. Here evaporation proceeds at a high rate through the capillary openings in the crust, while the plant whose roots are in the caked area wilts from thirst. In such instances, regardless of the proximity of the water table, the plant's necessities may require frequent irrigations, each of which not only moistens the surface but reestablishes lento-capillarity for a longer or shorter period with the subirrigated soil below. The actual soil absorption of water in such cases may be materially less than on averaged drained lands. On the other hand, the evapo-transpiration loss will be very much higher.

Quantity of Irrigation Water Required—The whole subject of water duty is summed up in the quantity of water applied and the frequency of irrigations. In the Truckee Valley the furrow and flooding methods of application are employed exclusively, and in general are better adapted to the field slopes than would be either the check or border systems.

If we consider merely an individual farm, whereon the furrow and flooding method is used and where a part of the water applied runs off as waste water from the lower end of the farm, it very likely would show a low water duty. But if we take the valley in which such farm is located, comprising a large number of farms and wherein the waste water from one farm is applied upon the next and so successively to the lower limits of the valley, we might find that the valley as a whole shows a reasonably high water duty as determined by dividing the total stream diversion heads by the total acreage. Using the valley as a unit, each farm is charged only with the quantity of water which its soil actually absorbs—not the quantity applied. Now it might very reasonably be that by using such larger head, and so covering the field more quickly than with a smaller head, the actual loss of irrigation water from evapo-transpiration and seepage, on the farms as a whole, would be less than with heads, in each instance diminished to the point where no waste water flowed off any farm.

The effect of a large head in irrigation is to enable the lower end of the field to receive water as soon as practicable after its application at the upper end. With a small head, if the soil is porous, the upper

part of a field may absorb an excess(wasteful)quantity of water long before the lower part of the field has received its proper quota, and this tendency cannot entirely be overcome by shortening the field lengths, except at the expense of an undue number of cross ditches, an inconvenience in harvesting and loss as well of effective crop area.

Frequency of Irrigations—The best rule ever devised for determining the frequency of irrigation is the need of the crop itself for water. It will vary with different crops, different soils, and seasonal and climatic changes. There is no hard-and-fast rule for any crop or any soil. Such crops as alfalfa and potatoes will tell an experienced irrigator by their color when they require irrigation, and give larger yields when irrigated in accordance with such announcements of need than by any other rule. If excessively watered, alfalfa will give public advertisement of the fact by the yellowish hue of its verdure, and penalize the farmer by reduced yield.

Finally, as shown in Table IV, quantity production of any crop can only be had at the expense of more water, relatively, than the lesser yields where moisture is limited.

Improvident Use of Water—The progress of Nevada for all time will probably be measured in terms of the duty of water. The State will insist with increasing authority each succeeding year that a water right is not fixed in quantity by original appropriation or court decision, but by the measure of its beneficial use in accordance with progressively economic methods of application. We have not reached the time when more than a reasonable economy in its use is demanded. In a decade hence, perhaps sooner, more refinements in its application will undoubtedly be insisted upon, since the State's expansion is limited by its water supply and essentially therein is vested public policy.

In the Truckee Valley, the most improvident use of water is in the growing of meadow grasses on the lowlands. The crop is inferior in quality and yield to other crops which the same lands would produce if properly drained. From six to eight inches less vertical depth of water would be required for irrigation were such lands drained and in deeper-rooted crops than is now applied. On the other hand, the seasonal evapo-transpiration loss would be decreased by probably 10.000 acre-feet.

PART II

WATER LOSS IN THE TRUCKEE VALLEY

The method of computing the water loss in the Truckee Valley, chargeable to the irrigated area, is based upon the following assumptions:

- A—That there is no subterranean leakage from the Truckee Valley basin; that the difference between total inflow and total outflow is the total loss, and that such loss is therefore chargeable to evaporation and transpiration alone.
- B—That the total inflow into the valley is represented by the sum of the following, in which (d) is the only unknown quantity—
 - (a) Discharge of the Truckee River at State Line (Table V);
 - (b) Discharge of all creek inflows (Table IX);
 - (c) Precipitation (Table VIII);
 - (d) Subsurface inflow.
- C—That the total outflow is the discharge of the Truckee River at Vista (Table VI).
- D—That the valley area exterior to the boundaries of the irrigated area may be disregarded as having no material influence on the problem here represented.
- E—That retarded seepage, returning to the river within the irrigation season, is a plus correction of the water loss, as measured by the difference between inflow and outflow; and seepage recovered after the irrigation season is a minus correction.

Precipitation Factor—Within the normal irrigation season, May to September, the mean annual precipitation at Reno is but 2.01 inches. We have computed it as a factor increasing inflow for such months applicable only to what falls upon the irrigated area, which is estimated at 33,500 acres.

TABLE VIII—*Precipitation Truckee Valley, Based on Reno Monthly Means*

Month	Inches	Acres-Foot
May	0.75	200
June	0.29	84
July	0.37	105
August	0.32	94
September	0.28	73
Total	2.01	566

Creek Inflow Factor—The following tabulated estimates of creek discharges into the Truckee Valley are based on such measurements as are available, corrected in each instance by relative seasonal precipitation and finally by the relative area, elevation and general direction of slope of the catchment area. While the per cent of probable error, due to the meagerness of measurement data, is larger than one would wish, any such error is corrected, in so far as affecting final results, by a reciprocal variation in subsurface inflow as hereinafter explained (see "May").

TABLE IX—*Estimated Creek Discharge Into the Truckee Valley*

<i>Creeks</i>	<i>May</i>	<i>June</i>	<i>July</i>	<i>Aug.</i>	<i>Sept.</i>	<i>Total</i>
Dog Creek.....	1,600	500	100	50	50	2,300
Hunter Creek.....	1,500	1,600	500	400	350	4,350
Evans Creek.....	600	400	100	50	50	1,200
Thomas Creek.....	800	850	300	150	100	2,200
Browns Creek.....	800	1,000	400	200	150	2,550
Steamboat Creek.....	1,600	1,700	600	300	250	4,450
All other creeks.....	300	150	.....	.....	.....	450
Totals	7,200	6,800	2,000	1,150	950	17,500

Subsurface Inflow and Seepage Return—It is obvious from the foregoing that the real problem presented relates (a) to the determination of the underground inflow into the valley from the mountain catchment area, chiefly on the west side, and (b) to the determination of the time and quantity of retarded seepage return to the river.

We assume, as justified by the factors of precipitation, date of average snow disappearance and abruptness of the slopes, that all underground inflow into the valley will have ceased by August 1, with the possible exception of comparatively small quantities in very wet and late seasons, and which, when distributed through a 12-season average, may be regarded as negligible. And that, for like reason, in very dry seasons such underground inflow will have substantially ceased by July 1. Both these assumptions are subsequently proved to be correct (see "Preliminary Determination of July").

Apparent Water Loss—The following table gives the apparent monthly water loss by evapo-transpiration from the irrigated lands of the Truckee Valley; uncorrected by the subsurface inflow and return seepage. The excess Truckee River discharge at State Line over that at Vista (Table VII) is used to avoid unnecessary repetition, the results being the same:

TABLE X—(Preliminary Computation) *Apparent Mean Water Loss, Truckee Valley, May to September, Inclusive*

	<i>May</i>	<i>June</i>	<i>July</i>	<i>August</i>	<i>Sept.</i>
Table VII—Excess State Line.....	3,903	4,190	9,828	15,925	8,171
Table IX—Creek Discharges.....	7,200	6,200	2,000	1,150	950
Table VIII—Precipitation.....	200	84	105	94	73
Subsurface Inflow.....	?	?	?	0	0
Return Seepage.....	?	?	?	?	?
Total	11,303	10,474	11,933	17,169	9,194

Return Seepage Factor—Seepage from irrigation reaching the river outlet within the month in which applied is accounted for in the river measurements at Vista, hence does not enter into the problem presented.

We assume that retarded seepage return to the river from the most remote lands will have substantially terminated by the end of the third succeeding month after the irrigation, the zone next remote by the end of the second month, and the next or second *nearest* zone, by the end of the first succeeding month. If we represent the quantity

returning the first succeeding month by A, the second month by B, and the third by C, the situation may be graphically shown by the following:

TABLE XI—(Graph) Illustrating Retarded Seepage Return

	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
May.....		A	B	C				
June.....	A		A	B	C			
July.....	B	(A)		A	B	C		
Aug.....	C	B	(A)		A	B	C	
Sept.....		C	(B)	(A)		A	B	C
Oct.....			C	(B)	(A)			
Nov.....				(C)				
Dec.....					(C)			

The quantities represented by the letters above the dash in each column constitute an increase in the apparent water loss for each month, as given in Table X; the quantities below the dash a subtraction therefrom. A B and C, severally, are presumed to be substantially constant quantities in respect to May, June, July and August. For September a variation is noted (see p. 24). With the former months the net correction, as shown by the graph, would be the subtraction from the apparent water loss given in Table X of the quantities represented by the unbracketed letters below the dash. In such instance, August is the only month unaffected—hence, being without subsurface inflow, the water loss as given in Table X is assumed to be absolute and later so proved (p. 21).

Determination of B C (combined) Values—The mean excess discharge at Vista over that at State Line (Table VII), for November, is 4.381 acre-feet. Subtracting from this the sum of creek inflow, and precipitation upon, and evaporation from, river, creek, and drainage water-surfaces in November, the difference will essentially be the combined values of B C in acre-feet. November mean evaporation is 2.23 inches (Table I), precipitation .70 of an inch. The difference, 1.53 inches, is the net effect applicable to such water surfaces—estimated at 1,300 acres—and gives 173 acre-feet. Creek inflow is computed at 1,840 acre-feet. The sum of such factors of correction is 2,013 acre-feet which, subtracted from the Vista excess discharge, gives us the value of B C, combined, as 2,368 acre-feet.

Relative Field Evapo-Transpiration Status—Before we can proceed farther with our computation of the respective values of A B and C in acre-feet, we must consider a new factor, namely, relative field evapo-transpiration status.

With soil moisture and vegetation constant, the ratio of evapo-transpiration, one month with another, will be substantially in the same ratio as evaporation from a free water surface, since the only remaining factors affecting transpiration are those causing evaporation, *e. g.* climatic. But vegetation is not a constant, either in quantity, from

the standpoint of transpiration, or in respect to its action as a soil cover and consequent reflex upon evaporation. I have coined the term "relative field evapo-transpiration status," in lieu of anything better—hereinafter abbreviated as "relative F-E-T status"—to express the seasonal, crop and other changes which occur on any area, apart from climate, in relation to the factors producing evaporation and transpiration. Since the climatic coefficient is represented by the relative per cent of evaporation from a free water surface, such climatic coefficient multiplied by the per cent relative F-E-T status will be the final coefficient, representing all factors, for the given month. This problem of relative F-E-T status will be made clear by the following analysis of the Truckee Valley:

The per cent relative F-E-T status, as compared with August 100%, is a computed actual for June, July, and September, respectively, that for May being the only estimate. Such per cent is the quotient obtained by dividing the relative per cent computed water loss for the respective months, as compared with the August actual water loss, by the evaporation (climatic) coefficient. The coefficients of relative evapo-transpiration are products of the relative F-E-T status and evaporation percentages.

May—Alfalfa, grasses, grain, and all other crops immature, with probably not over one-third June average quantity of vegetation from which transpiration takes place, but offset by maximum area of uncovered and partly covered soil. Soil's physical condition in respect to lento-capillary action in the surface zone more favorable to evaporation than in any other month.

Relative F-E-T Status (Est.) 102.1%; Evap., 70.8%; Relative Evapo-Transpiration Coefficient, 77.8%.

June—Maximum month in quantity of vegetation subject to transpiration, with some reduction last week of the month due to beginning harvesting first crop alfalfa.

Relative F-E-T Status (actual) 107.5%; Evap., 91.2%; Relative Evapo-Transpiration Coefficient, 98.1%.

July—Reduction in quantity of vegetation, as compared with June, due to harvesting first crop alfalfa and portion of grass hay, offset in part by evaporation from uncovered soils between harvesting and new growth.

Relative F-E-T Status (actual) 89.5%; Evap., 99.8%; Relative Evapo-Transpiration Coefficient, 89.3%.

August—Alfalfa quantity exceeding that of July and about 70% June; grass hay harvesting completed fore part of month, leaving soils uncovered except by stubble and short growth of grasses; cessation of irrigation of grain.

Relative F-E-T Status, 100%; Evap., 100%; Relative Evapo-Transpiration Coefficient, 100%.

September—Minimum of the five principal irrigation months in quantity of vegetation subject to transpiration, in area irrigated and frequency of irrigations.

Relative F-E-T Status (actual) 83.7%; Evap., 74.8%; Relative Evapo-Transpiration Coefficient, 62.6%.

Preliminary Determination of July—We have assumed that August and September are the only two months within the irrigation season, as defined, which are unaffected by retarded subsurface inflow from

the surrounding mountain catchment area and that, dry seasons, July will be unaffected.

We now take the means of the three driest seasons, 1912, 1913, and 1918, for July and August, on the assumption that we have eliminated the factor of subsurface inflow from July, and expect to find that the mean water loss for July for such *dry seasons*, as measured by the difference between valley inflow and outflow, will be *greater* than the July mean for the 12-year period. This expectancy would not be valid if there were no subsurface inflow normally in July, since the apparent water loss for a given month, in dry seasons, would presumably be less than in normal seasons, due to some probable decrease resulting from relative water scarcity, in the quantity of irrigation applied.

If such expectancy be correct, such difference can only be accounted for as the measure (corrected for seasonal variation) of the subsurface inflow normally decreasing the apparent July water loss, but non-existent in dry seasons. While the mean seasonal discharge of the Truckee River at State Line for such three dry seasons as a whole was 64% normal, in computing creek variations for July and August we assume a probable variation from normal, in monthly flow, about the same as that of the river. This gives us a 61% of normal, relative variation for July and 94% for August, hence we take these percentages of normal creek flow for such months to get the respective dry-season mean quantities.

TABLE XII—*July and August Means of Three Driest Seasons, 1912, 1913, and 1918. River Discharge Mean 64% Normal**

<i>Source</i>	<i>July</i>	<i>August</i>
State Line Excess.....	13,658	15,596
Creek Discharges.....	1,220	1,080
Precipitation (actual).....	214	199
Subsurface Inflow.....	0	0
Apparent Water Loss.....	15,092	16,875

The dry-season August mean actual water loss is 16,878 acre-feet (Table XII) which is less than the 12-season mean by 294 acre-feet, a difference of 1.7% which we ascribe to relative mean seasonal variation, hence we increase the July dry-season loss by such per cent, a correction which gives us 15,348 acre-feet. This quantity is essentially the mean evapo-transpiration water loss for July, on the presumption that the June dry-season mean will have the same variation from normal as August. The probable difference, in any event, would be slight and may be disregarded. The substantial agreement of the August dry-season mean with that of the 12-season mean proves our assumption that August is unaffected by subsurface inflow.

*We do not include the factor of retarded seepage return in Tables XII and XIII since, in respect to apparent water loss, it is a constant for the respective months both in the dry-season and 12-season means.

Final July Computation—We found in the preliminary July computation the mean evapo-transpiration loss to be 15,348 acre-feet. Subtracting the 11,933 acre-feet (Table X—mean July water loss less subsurface inflow), the difference is 3,415 acre-feet, which is essentially the July mean therefor. The evapo-transpiration coefficient for 15,348 acre-feet is 89.3%, and from which we compute the relative F-E-T status (multiplying by climatic coefficient 99.8%) as 89.5%.*

June—For June we have one unknown quantity—subsurface inflow. We take the June mean of the three driest seasons, 1912, 1913 and 1918, as in the case of July, finding the difference between valley inflow and outflow to be 16,565 acre-feet (Table XIII), which we increase by 1.7%, seasonal variant, as in the July computation. This gives us, as

TABLE XIII—June Means Three Driest Seasons, 1912, 1913, and 1918.

Source	Discharge Period, 64%	June
Excess State Line.....		13,219
Creeks (51.5%).....		3,193
Precipitation (actual).....		153
Subsurface Inflow.....		?
Total Apparent.....		16,565

corrected, 16,847 acre-feet, which is essentially the mean evapo-transpiration loss for June. Subtracting from the 16,847 acre-feet above the 10,474 acre-feet (Table X) June surface water loss, for the same reason as in July, we get 6,373 acre-feet as the June mean subsurface inflow. The June evapo-transpiration coefficient, 98.1%, and relative F-E-T status, 107.5%, as in July, are substantially actuals.

Before we can proceed farther it is necessary to determine the respective values of A, B and C.

Computation of A B C Values Separately—We have found the value of B C, combined, as 2,368 acre-feet. Unfortunately there is no combination of any of the known or determinable quantities which will give us the A B C quantities separately, hence we have recourse only to estimates. We assume as probable, under retarded seepage conditions, that B is larger than C, and that A will probably be greater than B by about twice the difference between B and C. Assuming a value of 1,050 acre-feet for C, by such method of calculation we get the following results:

A.....1,854 acre-feet	A B C.....4,222 acre-feet
B.....1,318 acre-feet	A B.....3,172 acre-feet
C.....1,050 acre-feet	B C.....2,368 acre-feet

May—With May we are again confronted with the problem of subsurface inflow. In this instance there is no combination of quantities

*This shows a 10.5% decrease in July relative F-E-T status as compared with August, which is in part, at least, accountable in the July harvesting of first crop alfalfa. It further indicates the probability that evapo-transpiration (chiefly evaporation) from stubble and short-growth grass-land soils (the August prevailing condition) is as large, if not larger than from such lands (July prevailing condition) with the grass crop on.

which will give the actual, as with June and July, hence we must rely upon estimate.

For the purpose of governing such estimate, we add the value of A B C to the May surface water loss of 11,303 acre-feet (Table X) which gives us 15,525 acre-feet. Now, if subsurface inflow and A B C exactly balance, one being a plus and the other a minus in the equation, the 11,303 acre-feet apparent May water loss would also essentially be the evapo-transpiration loss.

We test this by computing the relative F-E-T status for May which it implies and comparing therewith the actuals for the other months. We get, as the tentative result, 127.6% for May, as compared with 107.5% for June, 89.5% for July, 100% for August, and 83.7% for September, showing that subsurface inflow must be materially less than 4,222 acre-feet, the A B C values.

We approach the question from another standpoint. We found the mean subsurface inflow for June to be 6,473 acre-feet, and for July 3,415 acre-feet. It seems clear from a study of conditions that June will carry the peak of the discharge with a diminishing quantity in May, in like manner as we found in July. It may be properly noted here that in the method of computation adopted, creek discharges and subsurface inflow, respectively, have identically the same effect upon the problem. Hence any error in computing creek discharges would be corrected, in respect to June and July, at least, by a reciprocal variation in the computed subsurface inflow. Within the limits of probable error in estimates, this would be true for May.

We assume that the relative F-E-T status of May, *as compared with June*, is not over 95%. This gives us a relative F-E-T status, as compared with August, of 102.1% (95% of 107.5%), and which we shall here adopt as our best estimate. Applying the relative climatic (evaporation) factor we get 72.2% as the coefficient of relative evapo-transpiration.

From the foregoing May coefficient we compute the evapo-transpiration loss as 12,396 acre-feet. Subtracting from this quantity the mean surface water loss of 11,303 acre-feet (Table X), we get 1,093 acre-feet as the mean subsurface inflow.

April—Early seasons, some irrigation of the alfalfa lands that are situate on the more sloping bench lands and where the soil is warm, occurs the latter part of April. For our 12-season averages, the mean April irrigation, in relative time and area, would not be a considerable factor in contributing to the water loss. For it is assumed that any evaporation from the irrigated area prior to the first application of water is a natural loss and not properly chargeable to irrigation. For the last half of April we may properly assume that the climatic coefficient will be approximately the mean between April as a whole (30.4%)

and May (70.8%) or 50.6%. The mean average date of the first irrigation of *all* the alfalfa area, some irrigated much earlier and some later, and including early and late seasonal variations, is estimated at not earlier than April 25, or the last fifth of April; and that the mean average date of irrigating *all* the grass lands is about May 1. We therefore exclude the grass area from consideration. The alfalfa area being about 40 per cent the total area, the equivalent of one-fifth of this, or 8% of the total irrigated area, would represent the per cent irrigated in terms of the whole. Assuming the same relative F-E-T status for April as found for May, 102.1%, 8% of this, or 8.2%, would represent such status in terms of the whole month. Applying to this the climatic coefficient found above of 50.6%, we get 4.2% of the May evapo-transpiration loss (11,296 acre-feet) as the quantity for April, which we increase to 5% to cover possible error. This gives us 565 acre-feet water loss. Since later on we will find that return seepage is equivalent to 30% of the evapo-transpiration loss, we find this quantity to be 170 acre-feet, the total of both being 735 acre-feet.

October—In October we have the terminal effects of irrigation, for a period equal to the average period between irrigations, following the date of the last average application of water—about October 10. We may therefore assume that 90% of the water loss in October is chargeable to irrigation. Creek discharges are computed at 1,240 acre-feet, which, plus retarded seepage return, with September A correction (see next paragraph), 3,740 acre-feet (4,222 - 482), gives a total of 4,980 acre-feet. From this we subtract the Vista excess of 530 acre-feet, which gives the net loss for October as 4,450 acre-feet, 90% of which is 4,005 acre-feet. This latter we estimate is the October evapo-transpiration water loss chargeable to the irrigated area, the remainder belonging to evaporation chiefly from the natural sloughs and meadows. Thirty per cent of this last quantity would give us the retarded seepage, or 1,202 acre-feet; the sum of both being 5,207 acre-feet.

September Correction for Water-Table Fluctuations—In 1917 some fifty wells were put down in the Truckee Meadows to determine the depth and fluctuation of the water table, as a basis for drainage estimates. The wells were quite generally distributed over the lowland area. Owing to scarcity of funds only a limited number of readings were obtained. Following are those in which we are interested; the mean depth in inches of the water table below the surface is given below the reading dates:

April 26	June 6	July 5	Aug. 2	Oct. 10	Dec. 3
24.84	18.72	20.88	21.72	28.80	32.64

Estimating 20% free water in the saturated soil below the water table, an increase of 1,785 acre-feet of soil water occurred between

April 26 and June 6, 75% of which, on a relative time basis, was contributed by May irrigation. Sinking of the water table 3 inches between June 6 and August 2 is accounted for in relative increased evapo-transpiration, which would have such tendency. For like reason we presume no material change in such August level for the remainder of the month. In such case, 75% of the 7.08-inch subsidence of the water table between August and October 10 would be chargeable to September, and since not occasioned by increased evapo-transpiration but occurring coincident with a 26% decrease in the climatic coefficient, it denotes 1,550 acre-feet less seepage water put into the ground by September irrigation than the average for the preceding months. This is a minus correction which gives 2,672 acre-feet as the September return seepage.

That such reduction will not affect the substantial validity of the A B C values as computed on the November basis is disclosed by the fact that a short A quantity of return seepage from October irrigation, not considered in such computation, closely offsets the September B shortage—A derived from August being considered normal. Since B represents 31% of A B C combined values, the September B quantity of November seepage return would be 827 acre-feet. Likewise, since A is 46.8% of such combined values, the October A seepage returning in November would be 527 acre-feet. The two quantities added give 1,354 acre-feet, as compared with 1,318 acre-feet computed B value, the difference, 36 acre-feet, being negligible.

TABLE XIV—(Final Computation) Mean Annual and Monthly Water Loss Chargeable to Evaporation and Transpiration, Irrigated Area, Truckee Valley, Nevada, in Acre-Feet.

	April %	May %	June %	July %	Aug. %	Sept. %	Oct. %	Totals
(1) Rel. F-E-T Status.....		101.1	107.5	89.5	100	83.7		
(2) Climatic Coef.	30.4	70.8	91.2	99.3	100	74.8	43.3	
(3) Evapo-Transp. Coef.....		72.2	98.1	89.3	100	62.6		
(4) River Excess State Line.....		3,908	4,190	9,828	15,925	8,171		42,017
(5) Precipitation		200	84	105	94	78		556
(6) Creek Discharges		7,200	6,200	2,000	1,150	950		17,500
(7) Subsurface Inflow		1,093	6,373	3,415	0	0		10,881
(8) Return Seepage (Plus)		170	1,854	3,172	4,222	4,222		13,640
(9) Net Retarded Seepage.....		4,052	2,368	1,050	0	0		7,470
(10) MINIMUM WATER APPLICATION... 735	16,618	21,069	19,570	21,391	13,416	5,207		98,006
(11) Return Seepage (Minus)..... 170	4,222	4,222	4,222	4,222	2,672	1,202		20,932
(12) EVAPO-TRANSP.	555	11,396	16,847	15,348	17,169	10,744	4,005	77,074

EXPLANATORY NOTES—TABLE XIV

- (1) Relative Field Evapo-Transpiration Status—See pages 19 and 20 for explanation.
- (2) Climatic Coefficient—Relative monthly evaporation from a free water surface, see Table I.
- (3) Evapo-Transpiration Coefficient—See pages 19 and 20 for explanation.
- (4) Truckee River excess discharge at State Line over that at Vista, see Table XII.
- (5) Mean monthly precipitation in acre-feet on the irrigated area.
- (6) Creek Discharges—Computed for all streams other than the Truckee River discharging into the Truckee Valley, see Table IX. Any error in quantity is corrected by reciprocal variation in subsurface inflow, due to method of calculating latter.
- (7) Subsurface Inflow—Water entering the valley from the surrounding catchment area between the surface and bedrock, and reaching the river between State Line and Vista.

(8) Return Seepage (Plus)—Retarded seepage which reaches the river and affects the measured discharge at Vista.

(9) Net Retarded Seepage—The difference between Return Seepage (Plus) and Return Seepage (Minus), representing the net quantity of retarded seepage.

(10) MINIMUM WATER APPLICATION—The minimum quantity of water necessary to be applied in irrigation, disregarding economic heads, to cover evapo-transpiration and net retarded seepage.

(11) Return Seepage (Minus)—The A B C quantity which irrigation puts into the soil each month in excess of the quantity lost from evaporation and transpiration, and which is recovered as return seepage during the three succeeding months. It is here credited back.

(12) EVAPO-TRANSPIRATION—The total actual water loss from the irrigated area chargeable to irrigation.

APPLICATION OF TABLE XIV TO TRUCKEE VALLEY IRRIGATED AREA

Total Water Loss Chargeable to Irrigation—We find the total evaporation and transpiration loss of water, and which, for reasons stated at the beginning of this section, is essentially the total water loss chargeable to the irrigated area, to be 77,074 acre-feet. The method of computation is such that the per cent of probable error resulting from instances where estimates were required would not appear seriously to affect the substantial accuracy of this result.

Water Loss Per Irrigated Acre—The irrigated area of the Truckee Valley, as previously estimated, comprises 35,000 acres, in round numbers, within which are 1,500 acres of tule and rush sloughs and water surfaces. In the foregoing, the Reno and Sparks city areas, aggregating about 1,500 acres, are represented by about 300 acres city lawns, gardens and trees actually irrigated, excluding the remainder. All water used otherwise by the two cities is presumed to return to the river through the sewage systems.

The irrigated area may be roughly classified as follows:

Drained Lands—In alfalfa, grain, potatoes, etc.....	16,000
Undrained Lands—Grass and meadows.....	17,500
Slough and water surfaces.....	1,500
Total acreage.....	35,000

While necessarily included as a factor in the water loss, the slough and water-surface areas within the Truckee Valley should be considered separately, since producing no crops and not a part of the actual irrigated area. In the absence of transpiration data concerning tules and rushes, it is here estimated that the loss of water from the slough and water surfaces will not be less than 85% the evaporation from a free water surface. Such per cent of the sum, in inches (Table I) of evaporation May to September, inclusive, plus 20% of April and 80% October, gives 46.2 inches, or 3.85 feet. Applied to the 1,500 acres in question, the water loss chargeable to this area would be 4,775 acre-feet. Subtracting the latter from the 77,074 acre-feet total evapo-transpiration loss, we get the net quantity chargeable to the actually irrigated lands, namely, 72,299 acre-feet. The latter quantity divided by the 33,500 actually irrigated acres gives, as the average water loss in vertical depth, 2.154 feet, or 25.85 inches.

Apportionment of Water Loss Between Drained and Undrained Lands—Unquestionably the evapo-transpiration loss per acre from the undrained lands is relatively greater than from the drained lands. We have submitted data in the first section establishing such to be the fact. The relative per cent is unknown. With the 2.154 feet average vertical water loss applying, we have, of the total 72,299 acre-feet water loss, 37,835 acre-feet charged to the undrained lands and 34,464 acre-feet to the drained area; the difference of 3,361 acre-feet representing merely the relative difference in area. A conservative estimate of the evapo-transpiration loss from the high-water-table lands would be 29 inches, as compared with the 25.85 general average. Such increased apportionment would reduce the loss from the drained lands to 22 inches, which is probably near the true quantity. The 17,500 acres of grass and meadow lands would therefore be losing 7 vertical inches excess water, equivalent to 10,300 acre-feet. There are good reasons to believe that this is somewhat under, rather than over, what would be actual wastage.

Effect of Drainage—Drainage of the 17,500 acres of lowlands and the 1,500 acres of slough and water surfaces would effect a combined saving (10,300 plus 4,775) of about 15,000 acre-feet. It would also hasten retarded seepage return within a thirty-day period, at most, as compared with three months, as at present. This would make available in the Truckee River, for use below Vista, the greater part of the retarded seepage that returns after October 15 and would advance seepage return generally such that an additional gain of probably 4,000 acre-feet would occur from such sources. Drainage would therefore effect a water saving estimated at 19,000 acre-feet.

Quantity of Water Applied in Irrigation—Table XIV shows the minimum monthly and seasonal quantity of water necessary to be applied to cover evaporation, transpiration and retarded seepage, aggregating 98,006 acre-feet for the season, and 21,391 acre-feet for the maximum month, August. This is the minimum quantity of water necessary to be applied in irrigation, with no provision for economic heads. By increasing the quantity applied above such necessary actual, we get—within essentially reasonable limits in point of quantity—a head of water in irrigation which enables it to be economically applied, both in respect to labor and water loss, as hitherto explained, and which surplus head, in the instance of the Truckee Valley, involves no increased loss of water. Such surplus or economic head may be visualized, as follows:

The slopes of the Truckee Valley, generally, are toward the Vista outlet, all drainage being in that direction. Diversion ditches on either side of the Truckee River divert the water to the irrigated lands at varying distances apart along various contour lines. The irrigated

lands lie between the highest ditch on the westerly side and the base of the hills on the easterly, or lower, side of the main valley, with the Vista outlet as the lowest point. Such irrigated lands are embraced in about 200 farms, of various acreages, some wholly between the diversion ditches, others intersected by one or more of them. Some receive water from one ditch alone, others from two or more ditches, and some in part or entirely from creek flows. The valley gradient is such that the surplus head from higher farms flows off the lower end as waste water, and is reused successively upon farms lower down until disposed in one or the other of the following ways: by being (a) wholly exhausted by soil absorption in some lower farm, or (b) in part so exhausted in the last farm in its course towards Vista, in which case only the balance will reach the river, or (c) passing undiminished off the last farm to the river outlet. It is of course understood that it will not be the same water.

Now, in the (c) instance, the same quantity of water flowing as waste water from an upper farm is discharged from the last farm. It has served as an economic head *for each farm on the way* without necessity of increasing its quantity. On the other hand, in the (a) instance, it has first served as an economic head for one or more upper farms and on the one in which exhausted has replaced in soil irrigation an equal quantity of diverted water. In the (b) instance a portion would serve in a like manner.

Thus we find that waste water resulting from an economic head from upper farms may continue successively to serve such purposes for lower farms, in flowing toward the river outlet, without requiring a new head quantity. Such head, however, will be retarded for the average number of days between irrigations. The head quantity required for each irrigation may be regarded as substantially a constant, and the total seasonal quantity required will be such quantity in acre-feet multiplied by the number of irrigations.

Frequency of Irrigations—Without actual records of the number of water applications on the several farms for each different kind of crop, and the same averaged and converted into terms of the whole irrigated area, an estimate is necessary. We assume that the mean date of beginning the first irrigation will be about April 25, and of ending of the last irrigation about October 10, covering a period of 168 days.* The average number of irrigations is estimated as not less than 12, averaging 14 days apart, nor more than 14, averaging 12 days

*These dates represent the means, in point of time, of the first and last irrigations—that is to say, the middle day of such irrigations on a 14-irrigation basis for the season, the computed period between irrigations for April being 18.7 days, the actual beginning of irrigation in April would be about the 16th, or 9.15 days prior to the 25th. Likewise, the October irrigation period being computed at 27.7 days, the final application of water on the last field irrigated would be about 14 days later, or approximately October 24. The mean date for each irrigation being as above given.

apart. The effect upon river discharge at Vista will not be materially different in either instance.

While the average frequency of irrigation is given as 12 or 14 days, the frequency of irrigations during the season will be in substantially the same ratio as the evapo-transpiration coefficients given in (3) Table XIV. We have previously given to the last half of April an evapo-transpiration coefficient of 50.6%, and since but six days of April are within the seasonal irrigation means, or one-fifth of the month, we divide this by 5 to get the per cent given in Table XV. Likewise the coefficient of October being 33%, 11% is used to represent the ten days of October within such means.

TABLE XV.—*Monthly Frequency of Irrigations and Average Number Acres Irrigated Daily, Based on 12 and 14 Irrigations, Respectively, During Season of 168 Days, Beginning April 25 and Ending October 10.*

Month	Evapo- Transp. Coef.	12 Irrigations			14 Irrigations		
		Number in Month	Days Apart	Acres Daily	Number in Month	Days Apart	Acres Daily
April	10.1	.27	21.1	.....	.32	18.7	.....
May	72.2	1.95	15.9	2,107	2.28	13.5	2,481
June	98.1	2.67	11.2	2,905	3.10	9.7	3,453
July	80.3	2.41	12.8	2,617	2.82	12.0	2,708
Aug.	100.0	2.70	11.5	2,913	3.16	9.8	3,419
Sept.	62.6	1.70	17.6	1,903	1.98	15.1	2,219
Oct.	11.0	.30	30.3	.....	.34	27.7	.....
		443.3†	12.00			14.00	

†443.3 divided by 12 gives 36.9, and by 14 gives 31.6, which quotients are used, respectively, as divisors of the evapo-transpiration coefficients to get the number of irrigations each month. Dividing the number of days in each month by the latter gives the days apart, and dividing the irrigated area by the days apart gives the number of acres which must be irrigated daily.

This table illustrates quite clearly the fact that if the quantity of water applied is a constant, irrigations must be more frequent in the hot than in the cooler months. On the other hand, if the irrigation periods remain about constant, there must be a compensating increase in the quantity of water applied.

Computation of Economic Head—We may estimate the number of irrigations as 14 for a season of 168 days, with an average frequency of 12 days, although probably occurring in about the frequency given in Table XV. The average acres irrigated daily would be 2,792, and the quantity of water absorbed by the soil to cover evapo-transpiration and seepage would be one-fourteenth of the seasonal quantity represented by evapo-transpiration and seepage minus evaporation from sloughs and water surfaces (98,006 acre-feet minus 4,775 acre-feet divided by 14), or 555 acre-feet, equivalent to 2.385 vertical inches.

This last quantity is entirely too small for economic application. Authorities generally concur that a 6-inch to a 6½-inch head is a reasonable application quantity—or economic head. We therefore adopt 6.385 vertical inches as approximating the required economic

head for the Truckee Valley, or 4 inches in excess of what the soil retains. This, on the 2,792 acres daily irrigated, represents 931 acre-feet, if the average field irrigation covers 24 hours. If such average be 12 hours, then the quantity would be diminished since, with the diversion a constant, the excess economic head applied on the area irrigated the first half of the day would again serve as a part of the excess head for the second half. Thus a part of such economic head would be twice used and the remainder once used the same day. As a matter of fact some undetermined portion of the Truckee Valley area is irrigated in 12-hour periods, some in 24-hour periods and some much longer. We may therefore estimate 931 acre-feet as approximating the excess quantity required above what is absorbed by the soil to supply an economic head of 6.385 vertical inches in field application. Such 931 acre-feet would successively cover the entire irrigated area in an average irrigation period of 12 days—represented by an excess daily diversion of 77.6 acre-feet—were the irrigated lands so located that none of such surplus water would reach the river until it had so served from the average highest to the average lowest farms. A portion, however, returns to the river before it has performed this complete service. Such difference must be compensated for by some increase in the daily diversion above given, probably to about 80 acre-feet, or approximately 40 second-feet. This represents a seasonal diversion of 13,440 acre-feet.

Of such excess diversion, 4,775 acre-feet is accounted for in the 98,006 acre-feet minimum applied water given in Table XIV, as evaporation from the 1,500 acres slough and water surfaces. The remainder, 8,665 acre-feet, becomes the estimated addition to such minimum applied water to get the total necessary for an economic head, namely 106,671 acre-feet. It should bear some close approximation to the total quantity of water diverted from the Truckee River and creeks by the several irrigation ditches. Any variation would indicate a correspondingly greater or less average economic head actually used by the farmers than the 6.835 vertical inches assumed in the calculation.

The effect of such surplus diversion for economic head upon the Vista discharge is the successive retardation for 12 days of 619 acre-feet of water ($\frac{1}{14}$ of 8,665 acre-feet) at each irrigation, equivalent to a constant retardation of 619 acre-feet of water from beginning to the end of the irrigation season, when it returns to the river.

RECAPITULATION

The minimum seasonal depth of water necessary to be applied to the land to cover evapo-transpiration and seepage (98,006 acre-feet minus 4,775 acre-feet — slough and water-surface evaporation — divided by 33,500 acres) is 2.78 vertical feet or 33.39 vertical inches, 77.6% of which

would be evapo-transpiration loss and 22.4% return seepage. This would be the condition were the sloughs and water surfaces eliminated. Under existing conditions, however, the 4,775 acre-feet above mentioned is an evaporation loss subtracted from the surplus or economic head applied in irrigation while such waters are retarded in the sloughs and water-surface areas in transit to the river outlet. Charging such evaporation to the irrigated area, which is proper under present conditions, the evaporation and evapo-transpiration loss plus seepage would require a minimum application, without additional correction for economic head, of 35.1 vertical inches, 77% of which would represent evaporation and evapo-transpiration and 23% return seepage.

We find that an economic head equivalent to 6.385 vertical inches applied water in irrigation may be supplied with a net increase of 8,665 acre-feet to the 98,006 minimum, representing a total diversion from the river and creeks of 106,671 acre-feet. That such 8,665 acre-feet for the season is represented by a constant retardation of 619 acre-feet of water during the irrigation season, returning to the river at the close thereof.

That, inclusive of such economic head, the average duty of water in the Truckee Valley is 3.184 vertical feet, or 38.2 vertical inches.

That of such applied quantity, 25.85 vertical inches, or 67.6%, is lost by evapo-transpiration from the irrigated area; 1.72 inches, or 4.5%, is lost by evaporation from slough and water surfaces; 7.49 vertical inches, or 19.6%, returns to the river as retarded seepage, and 3.14 vertical inches, or 8.2%, is returned as waste water.

The actual loss from evaporation and transpiration is 27.57 vertical inches, the remaining 10.63 inches returning as retarded seepage and waste water to the river channel.

If we consider the 16,000 acres drained lands separately; assuming 22 vertical inches, as heretofore estimated, to represent the evapo-transpiration loss, the water duty would be 34.96 vertical inches as compared with 41.96 vertical inches water duty for the grass and meadow area.

On the foregoing showing and with due consideration given the fact that approximately 54% of the irrigated lands are undrained natural meadows with a high water table, inclusive of 1,500 acres natural sloughs, it does not appear that the duty of water in the Truckee Valley is other than about a reasonable expectancy under economic usage. It further does not appear that any modification of the existing method of application would effect any appreciable saving. That saving must be looked for in the drainage of the valley lowlands.



STATE OF NEVADA

ABSTRACT OF CLAIMS

TO THE

Waters of Currant Creek and Its Tributaries

Compiled by the Office of State Engineer, Under Authority of Chap.
140, Statutes of 1913, as Amended by Chap. 253, Statutes of 1915

J. G. SCRUGHAM, State Engineer



CARSON CITY, NEVADA

STATE PRINTING OFFICE : : : JOE FARNSWORTH, SUPERINTENDENT
1919



GENERAL STATEMENT

The following tabulation consists of a concise statement or abstract of the claim of each water user claiming an interest in and to the waters of Currant Creek and its tributaries in so far as the names of such water users could be ascertained. Such abstract is prepared pursuant to the provisions of chapter 140, Statutes of 1913, particularly section 28 thereof, as said chapter is amended by chapter 253, Statutes of 1915.

Particular attention is called to the accompanying notice and order of the State Engineer required by said section 28 as to the period during which, and the place where, the maps, plats, data and evidence heretofore collected by or filed with the State Engineer will be open for inspection by all parties, and as to the time during which contests may be filed, as provided by section 29, chapter 140, Statutes of 1913, as amended by chapter 253, Statutes of 1915.

J. G. SCRUGHAM,
State Engineer.

STATE OF NEVADA STATE ENGINEER'S OFFICE

I, J. G. Scrugham, State Engineer of the State of Nevada, duly appointed and qualified, having charge of the records and files of the office of the State Engineer, do hereby certify that the following is a full, complete, and true copy of an abstract of claims in and to the waters of Currant Creek and its tributaries prepared, and filed in said office on the twenty-eighth day of November, 1919, as appears by the records and files of the office of the State Engineer of Nevada, and nothing more or less.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my seal of office at the City of Carson, State of Nevada, this twenty-eighth day of November, 1919.

J. G. SCRUGHAM,
State Engineer.

[SEAL]

Claimant—Cazier Bros.

Source—Currant Creek.

Ditch Title	Date when construction commenced	Date when land first irrigated	Number of acres irrigated	Sec.	Subdivision	Tp.	N.	R.	E.
Ditch No. 1.....	1868	1869 or 1870	8.342	24	SE $\frac{1}{4}$	11		58	
			6.507	25	NE $\frac{1}{4}$	11		58	
		1914	7.915	25	NW $\frac{1}{4}$	11		58	
			22.764						

NOTES: Claims water for stock and domestic purposes.
Irrigation season April to October, inclusive.

Claimant—Cazier Bros.

Source—Currant Creek.

Ditch No. 2.....	1868	1869 or 1870	11.250	25	W $\frac{1}{2}$ NE $\frac{1}{4}$	11		58	
			23.351	25	E $\frac{1}{2}$ NW $\frac{1}{4}$	11		58	
			27.113	25	SW $\frac{1}{4}$	11		58	
			7.345	26	SE $\frac{1}{4}$ SE $\frac{1}{4}$	11		58	
			69.059						

NOTES: Claims water for stock and domestic purposes.
Irrigation season April to October, inclusive.

Claimant—Cazier Bros.

Source—Currant Creek.

Ditch No. 3.....	1868	1869 or 1870	7.190	25	SW $\frac{1}{4}$	11		58	
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RECAPITULATION:

From Ditches Nos. 1, 2, and 3, Cazier Bros. •
80 acres irrigated prior to 1878.
About 11 acres additional irrigated between 1883 and 1901.
7.915 acres additional irrigated in 1914.

NOTES: Claims water for stock and domestic purposes.
Claims water to operate 25-foot overshot waterwheel.
Water used to operate wheel returned to stream.
Irrigation season April to October, inclusive.

Claimant—H. F. Rutherford.

Source—Currant Creek.

Ditch No. 1.....	1869	1870	2.48	26	SE $\frac{1}{4}$ SE $\frac{1}{4}$	11		58	
			2.09	26	SW $\frac{1}{4}$ SE $\frac{1}{4}$	11		58	
			6.53	35	NW $\frac{1}{4}$ NE $\frac{1}{4}$	11		58	
			1.45	35	NW $\frac{1}{4}$ NE $\frac{1}{4}$	11		58	
			3.50	35	NE $\frac{1}{4}$ NW $\frac{1}{4}$	11		58	
			7.28	35	SE $\frac{1}{4}$ NW $\frac{1}{4}$	11		58	
			10.86	35	SW $\frac{1}{4}$ NW $\frac{1}{4}$	11		58	

Acreage taken from map..... 34.19

Claims in proof..... 1870 35.00

NOTES: Claims water for stock and domestic purposes.
Irrigation season April to September, inclusive.

Claimant—H. F. Rutherford.

Source—Currant Creek.

Ditch Title	Date when construction commenced	Date when land first irrigated	Number of acres irrigated	Sec.	Subdivision	Tp.	N.	R.	E.
Ditch No. 2.....			8.31	35	NW ¹ NE ¹	11	58		
			2.97	35	NW ¹ NE ¹	11	58		
			.57	35	NE ¹ NW ¹	11	58		
			2.71	35	SW ¹ NE ¹	11	58		
			16.31	35	SE ¹ NW ¹	11	58		
			1.88	35	SE ¹ NW ¹	11	58		
			.97	35	SE ¹ NW ¹	11	58		
			.90	35	SW ¹ NW ¹	11	58		
Acres taken from map.....			34.64						
Claims in proof.....	1869	1870	35.00						
		1917	1.88	35	SE ¹ NW ¹	11	58		

Notes: Claims water for stock and domestic purposes.
Irrigation season April to September, inclusive.

Claimant—John W. Manson.

Source—Currant Creek.

John W. Manson Ditch.....	About		At least						
	1869	1872	40.00	as enumerated below.					
Lands irrigated prior to 1878			4.13	35	NW ¹ SW ¹	11	58		
			1.32	35	NW ¹ SW ¹	11	58		
			12.09	35	NW ¹ SW ¹	11	58		
			1.19	35	NW ¹ SW ¹	11	58		
			1.81	34	NE ¹ SE ¹	11	58		
			.41	34	NE ¹ SE ¹	11	58		
			13.78	34	SE ¹ SE ¹	11	58		
			†10.93	34	S ¹ SE ¹	11	58		
			.25	35	SW ¹ SW ¹	11	58		
			.87	3	NE ¹ NE ¹	10	58		
			.79	3	NW ¹ NE ¹	10	58		
		1910	*2.14	35	NW ¹ SW ¹	11	58		
			49.71						

Notes: Claims water for stock and domestic purposes.
Irrigation season March 15 to September 30, inclusive.
†Not all in S¹SE¹.
*Garden—irrigated in 1910.

Claimant—Geo. A. Manson.

Source—Currant Creek.

Ditch No. 1.....	About 1870	1872	12.00	3	SW ¹ NE ¹	10	58
Total acres irrigated prior to 1884			17.22	3	SW ¹ NE ¹	10	58

Notes: Claims water for stock and domestic purposes.
Irrigation season March to October, inclusive.

Claimant—Geo. A. Manson.

Source—Currant Creek.

Ditch No. 2.....	About 1870	1874	5.00	3	SE ¹ NW ¹	10	58
Total acres irrigated prior to 1884			8.33	3	S ¹ NW ¹	10	58

Notes: Claims water for stock and domestic purposes.
Irrigation season March to October, inclusive.

Claimant—Geo. A. Manson.

Source—Currant Creek.

Ditch Title	Date when construction commenced	Date when land first irrigated	Number of acres irrigated	Sec.	Subdivision	Tp.	N.	R.	E.
Ditch No. 3.....	About 1870	1869	20.00	3&4	SE1NW1	10	58		
Total acres irrigated prior to 1884			50.28	3	N1SW1	10	58		
			17.65	4	SE1NE1	10	58		
			1.50	4	SE1NE1	10	58		
			33.13	4	SE1NE1	10	58		
			102.56						

NOTES: Claims water for stock and domestic purposes.
Irrigation season March to October, inclusive.

Claimant—Geo. A. Manson.

Source—Currant Creek.

Ditch No. 4.....	About 1870	1871	5.00	3&4	SE1NW1	10	58		
Total acres irrigated prior to 1884			3.26	4	SE1NE1	10	58		
			5.95	4	SE1NE1	10	58		
			4.80	4	SE1NE1	10	58		
			0.59	3	SW1SW1	10	58		
			14.60						

NOTES: Claims water for stock and domestic purposes.
Irrigation season March to October, inclusive.

Claimant—John Lawton Butler.

Source—Currant Creek.

Ditch No. 1.....	About 1910	About 1910	About 3.00	4	NE1SE1	10	58		
			7.00	4	SE1SE1	10	58		
		Sept. 1915	*20.00	4	SW1SE1	10	58		
			*10.00	9	NW1NE1	10	58		
			*15.00	9	NE1NW1	10	58		
			55.00						

NOTES: Claims water for stock purposes.
Irrigation season March 15 to November 15, inclusive.
*Willow and rosebush pasture.

Claimant—John Lawton Butler.

Source—Currant Creek.

Ditch No. 2.....	About 1876	110.00	irrigated annually for many years.						
		50.00	9	NW1	10	58			
		2.00	9	SW1	10	58			
	Prior to 1905	14.00	6	NE1	10	58			
		14.00	8	SE1	10	58			
		2.50	8	NW1	10	58			
		2.50	8	SE1	10	58			
	Since 1905	3.30	8	NE1SE1	10	58			

NOTES: Claims water for stock and domestic purposes.
Claimant states that the lands listed in bracket have been irrigated by himself since 1915; by others annually for many years prior to 1915.
Irrigation season March 15 to November 15, inclusive.

Claimant—John Lawton Butler.

Source—Currant Creek.

Ditch No. 3.....	Not known	Prior to 1905	2.50	8	SW1NE1	10	58		
			3.50	8	SE1NE1	10	58		
			6.00						

NOTES: Claims water for stock and domestic purposes.
Irrigation season March 15 to November 15, inclusive.

Claimant—John Lawton Butler.

Source—Currant Creek.

<i>Ditch Title</i>	<i>Date when construction commenced</i>	<i>Date when land first irrigated</i>	<i>Number of acres irrigated</i>	<i>Sec.</i>	<i>Subdivision</i>	<i>Tp.</i>	<i>N.</i>	<i>R.</i>	<i>E.</i>
Ditch No. 4.....	Not known	Prior to 1876	5.00	7	NE¼	10		58	
			5.00	7	SE¼	10		58	
			30.00	8	NW¼	10		58	
			20.00	8	SW¼	10		58	
			<hr/> 60.00						

Notes: Claims water for stock purposes.

Irrigation season March 15 to November 15, inclusive.



STATE OF NEVADA

EDUCATIONAL DIRECTORY

AND

Information as to Certification of Teachers
and Epidemic Vacation Salaries, etc.

Prepared by
W. J. HUNTING
Superintendent of Public Instruction

December 1, 1919

CARSON CITY, NEVADA

STATE PRINTING OFFICE : : : JOE FARNSWORTH, SUPERINTENDENT

1919



CERTIFICATION OF TEACHERS IN NEVADA

Announcement of State Board of Education

CERTIFICATION ON CREDENTIALS

Applicants for certification on credentials from other States, who furnish satisfactory evidence of good moral character, sound health, and successful teaching experience (in case the applicants have taught), may be granted Nevada certification in accordance with the following regulations:

An applicant holding a standard college or normal diploma, or a life certificate of any State, may submit this in lieu of examination; and in the case of a college diploma there must be, in addition to the regular college work, a proper showing of training in educational subjects. On such college diploma and record of educational training a high-school certificate may be issued; on the normal diploma, a first-grade elementary certificate; and on a life certificate, a certificate of appropriate grade, though not necessarily of the same grade; *provided*, "that no high-school certificate shall be granted upon any credential not equivalent to a diploma of graduation from a science course or the liberal arts course of the University of Nevada, together with the required training in educational subjects." (Section 30, Nevada School Law.)

In presenting a college or university diploma as a credential for a high-school certificate, the applicant must show that he has had *sixteen semester units of education in a standard institution of learning*; *provided*, that if the applicant is a teacher of successful experience in high school, such experience may be considered by the State Board of Education as part of the required training in educational subjects. If a normal school diploma is presented as a credential for a first-grade elementary certificate, it must be from a state-supported normal school, showing a full two-year course above a standard four-year high school, or from any other standard normal school whose work is fully accredited by the State Board of Education of the State in which such normal is located.

Limited certificates of other States, or city and county certificates thereof, are not recognized for certification in Nevada. (See "Special Certificates for Vocational Subjects," page 5 of this pamphlet.)

No certificate will be issued to any person under 18 years of age.

ELEMENTARY CERTIFICATES ON EXAMINATION

The subjects in which applicants are required to pass satisfactory examinations for elementary certificates are:

Mental arithmetic, physiology and hygiene, orthography, English grammar, written arithmetic, drawing, United States history, reading, general history, current events, geography, music, business forms and elementary bookkeeping, penmanship, civics, theory and methods.

Examinations for teachers' certificates are held semiannually in different parts of the State in June and December. These examinations are uniform and are all held under the authority of the State Board of Education.

Applicants for the different grades of elementary certificates are all examined in the same subjects.

The elementary certificate of the first grade issued on examination shall be valid for three years from the date of issuance. It shall not be issued to any

person whose general average is less than 85 per cent or whose grade is less than 65 per cent in any one subject. The elementary certificate, first grade, shall not be issued to any person under 20 years of age, nor to any person who has not had sixteen months of successful experience in teaching. Such certificate may be renewed by the State Board of Education upon receipt of satisfactory evidence of successful work in a standard summer school, normal school or college, or of approved correspondence course study, such work to be completed during the life of the certificate.

CREDITS TOWARD A FIRST-GRADE ELEMENTARY CERTIFICATE: An applicant for an elementary certificate who shall make in any regular examination a standing of 85 per cent in any subject shall receive credit in such subject toward a first-grade elementary certificate; and the State Board of Education may allow credit for satisfactory work done by applicants for certificates on examination, in a standard summer school (or recognized normal school), in determining their per cent standing in any subject or subjects.

The elementary certificate, second grade, shall be valid for two years from the date of issuance and shall be issued upon examination in all subjects required for the first-grade elementary certificate; *provided*, that no second-grade elementary certificate on examination shall be issued to any person whose general average is less than 75 per cent, or whose grade is less than 60 per cent in any one subject. In no case shall an elementary certificate of the second grade be renewed.

No certificate will be issued to any person under 18 years of age.

HIGH-SCHOOL CERTIFICATES ON EXAMINATION

Examinations for high-school certificates will be given at each of the semi-annuals; *provided*, that there are applicants therefor who have made application to the State Board of Education at least thirty days prior thereto, designating the subjects they will be prepared to present from groups B and C as shown below.

For convenience of illustration, the subjects of examination may be placed in three groups classified as A, B, C. In group A, *all* are to be taken; in B, *one* only; in C, *three*.

A. English grammar, spelling, arithmetic, English literature, general history, history of the United States, civil government, algebra, plane geometry, physics, history and methods of teaching.

B. Latin, French, German, Spanish.

C. Rhetoric, English history, solid geometry, physical geography, chemistry, botany, zoology.

A high-school certificate issued on examination shall be valid for four years from the date of issuance; it will not be issued to any person whose general average is less than 90 per cent, or to any person who is under 20 years of age. It may be renewed by the State Board of Education according to such rules and regulations as the board may prescribe.

Credit toward a high-school certificate, to be obtained on examination, may be allowed, in the discretion of the State Board, for any required high-school subject satisfactorily completed in a standard college; and credit may be allowed to applicants who hold a Nevada elementary certificate of the first grade for a standing of 90 or more made in any of the required subjects of examination for a high-school certificate.

All examination papers are graded by the State Board of Educational Examiners, at Carson City, Nevada. Applicants will be notified of their success or failure by letter.

SPECIAL CERTIFICATES FOR VOCATIONAL SUBJECTS

The regular certificates do not cover vocational and other special subjects. For these, special certificates are issued, based on training and experience satisfactory to the State Board of Education. (See sections 23 and 33 of the School Code; also Bulletins of Vocational Education.)

LIFE DIPLOMAS

For laws governing the issuance of life diplomas, see School Code, sections 28 and 29.

Forty-five months of successful teaching is required of graduates of the Nevada four-year State Normal School, and for graduates of the two-year State Normal; for all other teachers, sixty months of successful teaching is required and twenty-four months of said teaching must have been in Nevada.

Life diplomas are of two grades—high-school and elementary. Forms for application therefor are furnished by the Superintendent of Public Instruction.

TEMPORARY CERTIFICATES**Regulations of the State Board of Education**

1. A temporary certificate should not be granted to any applicant who failed in the semiannual teachers' examination immediately preceding application therefor, or who was in the State and failed to take the examination, except as follows:

(a) That such applicant in the interim attended a standard normal school or a standard summer school for a period of not less than six weeks and made a satisfactory record therein, as officially attested by such school; or

(b) That such applicant has done two or more years of study successfully in a standard college or university.

2. Temporary certificates should not be granted to applicants from other States after a semiannual teachers' examination, unless said applicants hold teachers' certificates, state, county, or city, and have had some experience in teaching in this or other States, except as follows:

(a) That the applicant or applicants shall have had one year or more of training in a standard normal school; or

(b) Two or more years of successful work in a standard college or university.

3. A temporary certificate will not be issued to any teacher who is to act as principal of a high school or of an elementary school.

4. Temporary certificates are not to be issued on county certificates of other States until applicants' credentials are filed with the Secretary of the State Board of Education.

5. In granting temporary certificates, Deputy Superintendents should fill them out properly, including specifications of credentials on back of certificates, sign and date them, and at once forward them to the State Superintendent for countersigning and registering; and they shall at once notify the persons to whom such certificates are granted of the limitations and duration of said certificates. All temporary certificates upon being countersigned by the State Superintendent will be returned to the Deputy Superintendent issuing them.

6. Temporary certificates should be issued to teachers whose credentials are, in the opinion of the Deputy Superintendent, *probably*

sufficient for certification by the State Board without examination, but not clearly so, as the certificates thus issued are intended to bridge over probable favorable action by said Board.

Temporary Certificates Not Necessary, When. In all cases where the credentials submitted are *clearly* sufficient for certification by the State Board, Deputy Superintendents may consider the regular certificates as issued and place teachers on the legal list to receive salaries, pending formal action in the premises by the State Board.

THIRD-GRADE ELEMENTARY CERTIFICATES

Note the following regulation as to third-grade elementary certificates—granted only after the December examinations and good only in the school district in which the teacher has been employed up to said examinations on a temporary certificate. (See School Code, section 27.)

Beginning with September 1, 1915, a third-grade certificate will not be granted to any teacher making less than seventy (70) per cent in general average or less than fifty (50) per cent in any subject.

EPIDEMICS AND TEACHERS' SALARIES

(From 1919 School Code, page 38)

SECTION 104. A school month shall consist of four weeks of five days each, and teachers shall be paid only for the time in which they are actually engaged in teaching; *provided*, that when an intermission of less than six days is ordered by the Trustees no deduction of salary shall be made therefor; *and provided further*, that when on account of sickness or epidemic a longer intermission is ordered by the board of school trustees or by a duly constituted board of health, and such intermission or closing does not exceed thirty days at any one time, there shall be no deduction or discontinuance of salary or salaries therefor. The term "teacher," as used in this act, shall be understood to mean teachers, principals, and superintendents of the elementary and secondary schools of this State.

TRUSTEES TO GIVE WRITTEN CONTRACT

The law requires that the school trustees of any district must furnish their teachers with written contract at the opening of school. Blank contract forms, prepared in accordance with law by the Superintendent of Public Instruction and approved by the Attorney-General, can be secured from the Superintendent of Public Instruction or from the Deputy Superintendents. See 1919 School Code, p. 20, p. 11.

FREE TEACHERS' EMPLOYMENT SERVICE

The State Department of Education maintains a free employment service for teachers. It will be the continued policy to give preference to graduates of Nevada schools in recommending for teaching positions. However, the demand for teachers in the State is greater than can be supplied from graduates of Nevada schools, and teachers from without the State who are well qualified for their work are encouraged to come into the state schools.

Teachers can secure application blanks for teaching positions from the State Superintendent of Public Instruction at Carson City, or from the District Deputy State Superintendents, whose names and addresses appear in this directory.

Trustees in need of teachers are requested to register their wants with their Deputy Superintendent, or with the State Superintendent, stating definitely the position for which a teacher is desired, the length of the school term, the salary, cost of board, etc. When the request for teachers has been received from the trustees by the State Superintendent or the Deputy Superintendent, such names of available teachers as are on file will be furnished the trustees.

CARSON CITY, December 1, 1919.

A handwritten signature in black ink, reading "W. J. Hunting". The signature is written in a cursive style with a large, sweeping "H" and a long, trailing "g".

Superintendent of Public Instruction.

EDUCATIONAL DIRECTORY

Giving the Names and Postoffice Addresses of All School Officers
and Teachers in the State of Nevada, December 1, 1919

STATE SCHOOL OFFICERS

SUPERINTENDENT OF PUBLIC INSTRUCTION

W. J. Hunting.....Carson City
Charles Priest, Office Deputy.....Carson City

STATE BOARD OF EDUCATION

Emmet D. Boyle, Governor of Nevada, President.....Carson City
Walter E. Clark, President of the University of Nevada.....Reno
W. J. Hunting, Superintendent of Public Instruction, Secretary.....Carson City

REGENTS OF THE UNIVERSITY OF NEVADA

Hon. A. E. Cheney (1921).....Reno
Hon. B. F. Curler (1921).....Elko
Hon. Walter E. Pratt (1925).....Goldfield
Hon. Mrs. W. H. Hood (1927).....Reno
Hon. Miles E. North (1929).....Reno

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Mr. George H. Taylor, Secretary Emeritus.....Reno
Miss Carolyn M. Beckwith, Secretary.....Reno
Mr. Charles H. Gorman, Comptroller.....Reno

DEPUTY SUPERINTENDENTS OF PUBLIC INSTRUCTION

First Supervision District—Elko County

Claude L. Neely.....Elko

Second Supervision District—Eureka, Lander, and White Pine Counties

James V. Comerford.....Ely

Third Supervision District—Churchill, Humboldt, and Pershing Counties

Chauncey W. Smith.....Fallon

Fourth Supervision District—Douglas, Lyon, Mineral, Ormsby, Storey, and Washoe Counties

Merrill J. Burr.....Carson City

Fifth Supervision District—Clark, Esmeralda, Lincoln and Nye Counties

T. W. Chapman.....Las Vegas

STATE BOARD FOR VOCATIONAL EDUCATION

W. J. Hunting, Secretary.....Carson City
Homer Derr, State Director and Supervisor Agricultural Education.....Reno
Millicent L. Sears, Supervisor Home Economics Education.....Reno
....., Supervisor Trade and Industrial Education.....Reno

FACULTY OF THE UNIVERSITY OF NEVADA

<i>Name</i>	<i>Located at Reno, Nevada</i>	<i>Official Position</i>
Walter E. Clark, Ph.D.		President
Robert Lewers	Vice-President, Professor of Elementary and International Law and Municipal Accounting	
James Edward Church, Jr., Ph.D.	Professor of Latin Language and Literature	
Jeanne Elizabeth Wier, B.A.	Professor of History	
Peter Frandsen, M.A.	Professor of Biology	
Romanzo Adams, Ph.D.	Professor of Economics and Sociology	
Maxwell Adams, Ph.D.	Dean of the College of Arts and Science; Professor of Chemistry	
Herbert Wynford Hill, Ph.D.	Professor of the English Language and Literature	
Joseph Dieffenbach Layman, B.L.	Librarian	
Horace Prentiss Boardman, C.E.	Acting Dean of the College of Engineering; Professor of Civil Engineering	
Leon Wilson Hartman, Ph.D.	Professor of Physics	
Charles Haseman, Ph.D.	Professor of Mathematics and Mechanics	
Charles S. Knight, B.S.	Dean of the College of Agriculture; Professor of Agronomy	
Francis Church Lincoln, Ph.D.	Director, Mackay School of Mines; Professor of Mining; Director, State Mining Laboratory; Director Affiliated Schools of Mines	
Frederick Weston Wilson, M.S.	Professor of Animal Husbandry	
Reuben Cyril Thompson, M.A.	Professor of Philosophy	
J Claude Jones, A.B.	Professor of Geology and Mineralogy; Curator of Mackay Museum	
Walter S. Palmer, E.M.	Professor of Metallurgy	
Charles Worthen Spencer, Ph.D.	Professor of Political Science	
Albert Ellsworth Hill, A.B.	Professor of Rhetoric	
James Reed Young, Ph.D.	Professor of Education, and Acting Head of the Department	
Millcent L. Sears, B.S.	Professor of Home Economics	
Colonel John Paul Ryan, U. S. Army	Professor of Military Science and Tactics	
Edward Records, V.M.D.	Professor of Veterinary Science; Director, State Veterinary Control Service; ex officio State Quarantine Officer; Secretary State Board of Stock Commissioners	
Stanley G. Palmer, M.E.	Professor of Electrical Engineering	
Verner E. Scott, B.S.	Professor of Dairying	
Abbie Louise Day, B.S.	Professor of Education	
Charles Goggio, Ph.D.	Professor of the Romanic Languages and Literatures, and Head of the Department	
Katherine Lewers	Associate Professor of Freehand Drawing and Art	
Katharine Reigelhuth, M.A.	Associate Professor of German, and Head of the Department	
*Elsie Sameth, B.S.	Associate Professor of Physical Education for Women	
Archibald Edwards Turner, B. A.	Associate Professor of Oral English	
James Andrew Nyswander, B.S.	Associate Professor of Mathematics	
George Wallace Sears, Ph.D.	Associate Professor of Chemistry	
Charles Elliott Fleming, B.S.A.	Associate Professor of Animal Husbandry	
Frederick L. Bixby, C.E.	Associate Professor of Agronomy	
William Ernest Lowther, Ph.D.	Associate Professor of the Romanic Languages and Literatures	
Raymond O. Courtright, B.A.	Associate Professor and Head of the Department of Physical Training for Men, and Coach in Athletics	
Sanford Crosby Dinsmore, B.S.	Assistant Professor of Agricultural Chemistry; Commissioner Food and Drug Control and Weights and Measures	
Albert William Preston	Assistant Professor of Mechanical Engineering	
Louise M. Siss	Registrar	
Silas Calvin Feemster, M.A.	Assistant Professor of History	
Margaret Elizabeth Mack, M. A.	Dean of Women; Assistant Professor of Biology	
Cyrus William Lantz, M.A.	Assistant Professor of Botany	
Clifton Roy Hill, C.E.	Assistant Professor of Civil Engineering	
Fred W. Traner, A.B.	Assistant Professor of Education	
George Wallace Sears, Ph.D.	Assistant Professor of Chemistry	
George Hardman, M.S.	Assistant Professor of Agronomy	
Gilbert Bruce Blair, A.M.	Assistant Professor of Physics	
Miles Bryce Kennedy, B.S.	Instructor in Agricultural Chemistry	
Jessie P. Pope, B.S.	Instructor in Home Economics	
Charles LeRoy Brown, M.A.	Instructor in Biology	
Catharine Frances Somers	Instructor in Physical Education for Women	

Emma Caroline Diehm.....	Instructor in Music, Department of Education
Parry Borgstrom, Ph.D.....	Instructor in Chemistry
Florence A. Wilson, B.S.....	Instructor in Home Economics
H. A. Blood.....	Assistant in Shop Work

NEVADA AGRICULTURAL EXPERIMENT STATION

STAFF

Samuel B. Doten, M. A.....	Director and Entomologist
Charles S. Knight, B.S.....	Agronomist
Charles E. Fleming, B.S.A.....	Range Management
Edward Records, V.M.D.....	Veterinarian
Stephen Lockett, V.M.D.....	Assistant Veterinarian
Lewis H. Wright, D.V.M.....	Assistant Veterinarian
R. C. Louck, D.V.M.....	Assistant Veterinarian
M. R. Miller, B. S.....	Chemist
George Hardman, B.S.....	Assistant Agronomist
Nels F. Peterson, M.A.....	Assistant in Range Management
Maxwell Adams, Ph.D.....	Consulting Chemist
Peter Frandsen, M.A.....	Consulting Biologist
Frederick W. Wilson, M.S.....	Consulting Animal Husbandman
C. W. Lantz, A. M.....	Consulting Botanist
V. E. Scott, B.S.....	Consulting Dairy Husbandman
J. L. Webb.....	Bureau of Entomology, U. S. Dept. Agriculture
Ruth Miller, B.A.....	Secretary to Veterinary Department
Hester Mayotte.....	Secretary to Experiment Station

Administrative:

EXTENSION STAFF

Charles A. Norcross, A.B.....	Director
George L. Morrison, B.S.....	County Agent Leader
Mrs. Katherine Smith, A. B.....	State Leader of Home Demonstration Agents
Margaret M. Johnson, M.A.....	State Club Leader
Merle D. Collins, B.S.....	Assistant State Club Leader
Cecil W. Creel.....	County Agent Leader

Specialists:

Dr. Stephen Lockett, V.M.D.....	Field Agent in Animal Diseases
Verner E. Scott, B.S.....	State Leader in Dairying
	Specialist in Animal Husbandry

County Agricultural Agents:

S. Egbert Merrill, B.S.....	Clark County
Joseph W. Wilson, B.S.....	Lyon County
J. Carlos Lambert, B.S.....	Elko County
Cecil W. Creel.....	Washoe County
J. L. McGinnis.....	Churchill County

Home Demonstration Agents:

Adelaide L. Phillips.....	Clark County
Amelia S. Conant.....	Churchill County
Edith G. Knippenberg.....	Douglas and Ormsby Counties

County Club Leaders:

Leah Barker, B.S.....	Churchill County
Mildred Meskimons, B.S.....	Elko County

PUBLIC SERVICE

State Veterinary Control Service.....	Edward Records, V.M.D., Director
State Hygienic Laboratory.....	Gustav F. Ruediger, Director
Food and Drugs Control and Weights and Measures.....	Sanford C. Dinsmore, B.S., Commissioner
State Analytical Laboratory.....	Francis Church Lincoln, Ph.D., Director

COUNTY NORMAL TRAINING SCHOOLS

Board of Control, State Board of Education, W. J. Hunting, Secretary

Lincoln County Normal—Panaca

Miss Mina Connell, Instructor.....Salary, \$1,800

PRINCIPALS OF COUNTY HIGH SCHOOLS

Churchill County, Fallon.....L. A. Pringle
 Clark County, Las Vegas.....George T. Beach
 Douglas County, Gardnerville.....T. S. Hook
 Elko County, Elko.....G. C. Jensen
 Elko County, Wells.....Paul H. Neuman
 Eureka County, Eureka.....Joseph Dickinson
 Humboldt County, Winnemucca.....J. D. Scott
 Lincoln County, Panaca.....H. A. Whiteneck
 Lyon County—

Yerington, District No. 1.....B. G. Bleasdale
 Dayton, District No. 2.....Jesse J. Beaty
 Smith Valley, District No. 3.....Edna L. Greenough
 Fernley, District No. 4.....Not yet organized
 Mineral County, Hawthorne.....U. W. Keplinger
 Pershing County, Lovelock.....H. W. Baker
 White Pine County, Ely.....A. S. Kubitz

PRINCIPALS OF DISTRICT HIGH SCHOOLS

Battle Mountain.....C. A. Robinson
 Carson City.....E. L. McKeown
 Educational District No. 1, Clark County—
 Bunkerville.....L. R. Hafen
 Overton.....E. L. Lilljenquist
 Goldfield.....A. W. Armitage
 Metropolis.....Bertha C. Knemeyer
 Reno.....E. O. Vaughan
 Sparks.....C. H. Meeker
 Tonopah.....G. L. Dilworth
 Virginia City.....H. O. Williams

SUPERINTENDENTS AND PRINCIPALS, DISTRICTS OF FIRST CLASS

Carson City.....E. L. McKeown, City Superintendent
 Consolidated B., Fallon.....L. E. McFadden, City Superintendent
 Educational District No. 1, Clark County.....A. L. Kelley, Overton, Superintendent
 Elko Elementary.....S. O. Welday, City Superintendent
 Ely Elementary.....Mary S. Black, Principal
 Goldfield.....A. W. Armitage, City Superintendent
 McGill.....J. W. Morrison, City Superintendent
 Reno.....B. D. Billinghamurst, City Superintendent
 Sparks.....C. H. Meeker, City Superintendent
 Tonopah.....G. L. Dilworth, City Superintendent
 Winnemucca.....Jessie I. Diamond, Principal

SCHOOLS OF MINES

Ely.....V. M. Henderson, Principal
 Goldfield.....G. E. Hofmann, Principal
 Tonopah.....Ellsworth R. Bennett, Principal
 Virginia City.....Dwight T. Smith, Principal

**CLERKS OF BOARDS OF SCHOOL TRUSTEES AND TEACHERS OF ALL
SCHOOL DISTRICTS IN THE STATE, DECEMBER 1, 1919**

First Supervision District—Elko County

District	Clerk	Teachers	Postoffice	Salary
Alegbeny	Amos Roach		Mountain City	
Arthur	Mrs. M. Griswold	Edna Inman	Lurline	\$800.00
Aura	Mrs. Barney Horn		Aura	
Bruneau	Robert Prunty	Dr. William Phipps	Charleston	800.00
Bryan	J. M. Prunty	Dormant	Charleston	
Bael	C. M. Clayton	Ethel M. Clayton	Tecoma	810.00
Carla	Miss Rosa Sperlick	Lela A. Lenfest, Prin.	Carlin	1400.00
		Beatrice Misegadis	Carlin	1250.00
		Mrs. Ruth B. Leonard	Carlin	1250.00
		Lula O. Daniels	Carlin	1250.00
		Maud Wilkins	North Fork	800.00
Clayton	Arthur L. Clayton	Eva Hale	Wells	1045.00
Cover Valley	Mrs. J. Weeks	Mrs. Amy H. Parker	Cobre	980.00
Cobre	Mrs. M. E. Bennett	Mrs. W. A. Southard	Contact	900.00
Contact	W. E. Dunkle		Mountain City	
Cope	George A. Nelson	Musa Gobin, Principal	Deeth	980.00
Deeth	Mrs. A. P. Cannon	Ada Goodale	Deeth	800.00
Diamond A.	B. B. Larios	Ruby L. Evans	Jarbridge	855.00
East Ruby	Thomas N. Terry	Dormant	East Ruby	
Edgemont	George Boyce	Samuel O. Weiday, Supt.	Edgemont	2220.00
Elko Elementary	John Hunter	Rose Gardner	Elko	1450.00
		Lillian Porter	Elko	1150.00
		Blanche Langdon	Elko	1200.00
		Kathryn Cicale	Elko	1150.00
		Ida Timm	Elko	1200.00
		Christine English	Elko	1100.00
		Barbara Higginbotham	Elko	1100.00
		Mollie Curlier	Elko	1100.00
		Alta M. Byrne	Elko	1100.00
		Theresa A. Taber	Elko	
		Genevieve Lyng	Elko	1300.00
		Ora Spencer	Elko	1300.00
Elko County High School No. 1	W. R. Englert	George C. Jensen, Prin.	Elko	3600.00
		E. E. Franklin	Elko	1750.00
		Clarence A. Finch	Elko	1800.00
		Phoebe A. Duane	Elko	1700.00
		Nellie Wilkerson	Elko	1350.00
		Marie Romano	Elko	1500.00
		Hattie Scroggs	Elko	1400.00
		Gladys Rainier	Elko	1450.00
		Minnie Snorin	Elko	1400.00
		Ella Hathaway	Elko	1400.00
		Mrs. C. L. Neely†	Elko	900.00
Elko County High School No. 2	W. R. Englert	Paul H. Neuman, Prin.	Wells	2400.00
		Mae Campbell	Wells	1400.00
		Juanita Frey	Wells	1400.00
		Dormant	Tober	
Fair View	Mrs. L. Bissell	Mrs. Alice Gammon	North Fork	1000.00
Harrison	Chester B. Laing	Ida Henry	Montello	805.00
H. D.	Mrs. Ida A. Austin	Mrs. Anna Dowden	Lurline	855.00
Hoover	Mrs. J. W. Jukes	Cone Cutler	Lamolle	945.00
Humboldt	Ed. U. McDermott	Alice Hepworth	Elko	810.00
Hunter	J. F. Klaner	Mrs. Leah Davis	Hylton	765.00
Huntington	Clyde W. Lang	Clara B. Plumb	Tuscarora	830.00
I. L.	Mrs. Jake Reed	Dormant	Tuscarora	
Independence	D. B. Williams	(Summer School)	Mountain City	800.00
Inland Mountain	H. Y. Reed	Gertrude Sears	Tuscarora	900.00
Jackson Creek	Mrs. R. M. Woodward	Mrs. Edith Ryan	Jarbridge	1280.00
Jarbridge	Mrs. U. G. Baker	Lela Ogilvie	Lee	720.00
Kleckner	Mrs. H. C. Kleckner	Raymond Swick, Prin.	Lamolle	990.00
Lamolle	Mrs. J. McDermott	Shirley Worden	Lamolle	900.00
Lincoln		Mrs. Martha Gardner	Ruby Valley	900.00
McCall	Mrs. W. J. Gardner	J. W. Hayman	Elko	800.00
Metropolis	Chas. Dressi	Bertha C. Knemeyer, Prin.	Metropolis	2400.00
	L. F. Hatch	Margaret Lee	Metropolis	1650.00
		Mercy Shawhan	Metropolis	1200.00
		C. E. Jones	Metropolis	1800.00
		Gertrude Hunt	Metropolis	945.00
		Florence Goodale	Metropolis	900.00
		Eleanor L. Hasenkamp	Metropolis	1125.00
Midas	R. T. Noble	Rose Tolley, Prin.	Midas	990.00
		Mrs. Lessie Noble	Midas	900.00
Milne	E. J. Kearns	Dormant	North Fork	
Montello	Wm. Fuller	Frances Brown	Montello	1125.00
		Matilde McCulston	Montello	990.00

CLERKS OF SCHOOL BOARDS, AND TEACHERS—*Continued*

District	Clerk	Teachers	Postoffice	Salary
Mound Valley	Albert Hankins	Virginia Dittes	Hylton	\$800.00
Meyers	Mrs. B. F. Meyers	Sariba Guill	Midas	900.00
North Humboldt	G. F. McKnight	May Enner	Deeth	900.00
North Ruby	Mrs. Grace Duval	Sarah Halpin	Arthur	900.00
North Star	Mrs. Nenie Black	Mrs. R. Krumbine	Deeth	900.00
Panama	Mrs. M. M. Rockwell	Mrs. A. B. Grace	Lamolle	900.00
Peko	L. H. Rathfon	Elsie F. Hawkins	Halleck	900.00
Piccalilli	A. O. Wilson	Dormant	San Jacinto	
Pilot	A. J. McCuiston	Rachael Fitch	Montello	900.00
Pine Mountain	Mrs. W. S. Raine		Palisade	
Polar Star	Tom Carter	Mrs. Mary M. Check	Polar Star	770.00
Rabbit Creek	George Hennen	Dormant	Lamolle	
Roland	John B. Scott	R. I. Hagenbuch	Roland	800.00
Ruby Central	I. E. Wines	Doris Disber	Ruby Valley	
Ruby City	Lewis Sharp	Estella Wines	Lurline	900.00
Ruby Valley	S. T. Wines		Ruby Valley	
Ryndon	H. O. Wood	Alice Griswold	Halleck	855.00
Shafter	Mrs. Geo. C. Reed	Dormant	Shafter	
Sherman	Fred Walther	Rebecca Dodds	Sherman	800.00
Signal	Mrs. Frank Winchell	Myrtle Dodds	Wells	900.00
South Fork	James Holland	Clyde Butler	Lee	900.00
Spring View	W. S. Short	Sylvia Weeks	Lurline	900.00
Sprucemont	Henry Phalan		Currie	
Star Valley	Isaac Griswold	Janet Ferguson	Star Valley	1200.00
		Mrs. Mabel Smith	Star Valley	1000.00
Success	Joe Walthers	Agnes Thompson	Halleck	800.00
Railroad	Dan Frank	Dormant	Bullion	
Taber City	Mrs. Lixsie Morgan	Dormant	Afton	
Tecoma	C. W. Storkey	Edgar Thomas Clayton	Tecoma	800.00
Ten Mile	Della S. Chennoweth	Dormant	Elko	
Tobar	Mrs. E. E. Glasser	Thelma Trevellick	Tobar	800.00
Town Creek	Mrs. R. I. Woods	May James	Wells	800.00
Tuscarora	Z. F. Wheeler	G. C. Campbell	Tuscarora	1000.00
Twelve Mile	C. C. Crone	Effe Jones	Montello	800.00
Upper South Fork	Mrs. Maude Bolton	Ruth West	Lee	990.00
Van Duser	Homer Audrae	Mrs. M. Elsberry	Mountain City	700.00
Weiland	E. E. Oldham	Della Oldham	Elko	700.00
		Leila T. Welshons	Elko	700.00
Wells	Mrs. Elizabeth Allen	Florence Tannahill	Wells	1500.00
		Ruth Dean Daugherty	Wells	1100.00
		Margaret McDonalds	Wells	1100.00
Whiterock	Henry Winter	Mrs. Henry Winter	Whiterock	800.00
Wilson	Jess F. Baker	Fay Harris	Gold Creek	760.00

*Yearly salaries given when known; otherwise monthly.

†Part time.

Second Supervision District—Eureka, Lander, and White Pine Counties

County and district	Clerk	Teachers	Postoffice	Salary
EUREKA				
Aerial	Floyd Grimes	Emily Grimes	Austin	\$90.00
Alpha	Nick Modarelli	Eleanor Fahden	Alpha	100.00
Antelope	Susie Blair	C. B. Page	Eureka	100.00
Birch	Mrs. J. R. Jacobson	Andrew J. Crofut	Eureka	80.00
Beowawe	J. H. Keefe	Mrs. G. W. Shultes	Beowawe	110.00
Cottonwood	James Hunter	Dormant	Eureka	85.00
Damele	Antone Damele	Vera L. Webb	Tonkin	100.00
Diamond	Edgar Sadler	Marian Earl	Eureka	105.00
Eureka	F. C. Lewis	Jos. Dickinson, Principal	Eureka	2000.00
		Christye MacGillivray	Eureka	1100.00
		Ruby Simonsen	Eureka	1100.00
		Eileen Breen	Eureka	1100.00
		Isabel Meriardo	Eureka	1100.00
Ferrari	Mrs. Paul Ferrari	Dormant	Palisade	
Fye Canyon	Mrs. Mary Isaac	Pearl Sciuchetti	Tonkin	90.00
Grass Valley	Mrs. Fritz Walti	Henrietta A. Bertholeau	Tonkin	100.00
Italian Ranch	Angelo Depaoli	Dolores Mann	Eureka	100.00
Mineral Hill	B. H. Bruffey	Ruth Scottford	Palisade	100.00
Palisade	Wendel Jones	Cordelia Wallace	Palisade	120.00
Pine Mountain	W. S. Raine		Palisade	95.00
Pine Valley	W. S. Yates	Ella Hildebrand	Palisade	90.00
Pinto	Mrs. P. Schaeffer	Anna S. Lederer	Eureka	80.00
Prospect	Joseph Tamletti	Elsie Hooper	Prospect	90.00
Ruby Hill	J. W. Kitchen	Stella Gianoli	Eureka	90.00
County High School	E. A. Skillman	Jos. Dickinson, Principal	Eureka	2000.00
		Dorothy Gilcrest	Eureka	1400.00
		Ruth M. Byrkit	Eureka	1400.00

CLERKS OF SCHOOL BOARDS, AND TEACHERS—*Continued*

County and district	Clerk	Teachers	Postoffice	Salary
LANDER				
Austin	H. A. Kearns	Lavina Mullie, Principal..	Austin	\$1500.00
		Rosa Schmalling	Austin	1100.00
		Grace Vann	Austin	1100.00
		Margaret Miles	Austin	1100.00
Battle Mountain	Mrs. Alice Rose	C. A. Robinson, Prin.....	Battle Mountain..	1800.00
		HIGH SCHOOL		
		Dorothy Hempton	Battle Mountain..	1300.00
		Ester Mario	Battle Mountain..	.....
		ELEMENTARY SCHOOL		
		Anne O. Miller	Battle Mountain..	1100.00
		Sarah R. Marshall	Battle Mountain..	1050.00
		Lela Halsell	Battle Mountain..	1050.00
		Eliza Pierce	Battle Mountain..	1050.00
Cortes	Dormant			
Hilltop	E. O. Swackhamer	Mrs. May Swackhamer	Hilltop	100.00
Iowa Canyon	Joe Phillippe	Marguerite Heller	Austin	100.00
Kingston	H. S. Meyer	Mildred Caton	Austin	120.00
Laxague	New District	Automatically abolished ..	Austin .....	.....
Mill Creek	Mrs. Wm. Schwin	Dormant	Battle Mountain..	.....
Rees River	Victor Rubianes	Dormant	Austin .....	.....
Skull Creek	W. T. Maestretti	Philomena Borrego	Austin	100.00
Smith Creek	W. T. Maestretti	Vere De Ronden Pos	Austin	780.00
Tenabo	Mrs. A. E. Raleigh	Alma H. Daska	Beowawe	100.00
WHITE PINE				
Big Spring	Chas. Smith	Theresa Hanley	Burbank, Utah	\$100.00
Big Wash	W. M. Osborne	Dormant	Garrison, Utah .....	.....
Blackhorse	David S. Eldridge	Mary Eldridge	Oreocla	100.00
Bonita	John Tilford	Dormant	Baker .....	.....
Bothwick	W. C. Bradley	Mildred Reed	Ely	100.00
Broadway	George Kelley	Dormant	Idapah, Utah	80.00
Cherry Creek	F. L. Pierce	Mrs. I. W. Jordan	Cherry Creek	125.00
Cold Creek	W. A. Moore	Dormant		
East Ely	G. L. Deckelman	Eva H. Timmons, Prin.....	East Ely	1800.00
		Mildred DeSauteis	East Ely	1200.00
		Lillian Devlin	East Ely	1150.00
		Eva Torrence	East Ely	1200.00
		Nellie Halvorsen	East Ely	1150.00
		Ester Rumbaugh	East Ely	1400.00
Ely	R. H. Holtzman	Mary S. Black, Prin.....	Ely	1900.00
		Claire J. Beach	Ely	1200.00
		Ruth Swartout	Ely	1100.00
		Opheia Gilmore	Ely	1100.00
		Mayme Rorig	Ely	1150.00
		Ellen Munroe	Ely	1100.00
		Dorothy Parker	Ely	1200.00
		Myrtle M. Dewey	Ely	1250.00
		Ruth Reynolds	Ely	1100.00
		Mrs. Amy Powers	Ely	1100.00
		Thyrza Bridges	Ely	1100.00
Geahote	Mrs. P. H. Green	Anita Sudden	Cherry Creek	115.00
Gregory	Mrs. Anna Bellander	Mrs. Josie Meecham	Baker	100.00
Griswold	Mrs. Jane Zubiri	Dormant	Cherry Creek .....	.....
Hamblton		Dormant		
Kimberly	John V. Montague	Ann O'Brien	Kimberly	1250.00
		Winifred Graham	Kimberly	1250.00
Lane City	Thos. H. Silliman	Mrs. J. E. Wayman	Ely	1100.00
		Mrs. Etta McDonald	Ely	1000.00
Lund	J. J. Gubler	R. L. Page, Principal	Lund	1500.00
		Mrs. B. H. Bleghier	Lund	900.00
		Mrs. Maxie Ashby	Lund	900.00
		LaVeta Harrison	Lund	900.00
McGill	R. E. Middagh	W. J. Morrison, Supt	McGill	2250.00
		Doty Tipton	McGill	1400.00
		Cora M. Clark	McGill	1150.00
		Nell Hilton	McGill	1100.00
		Marguerite Ellis	McGill	1100.00
		Delight Willis	McGill	1000.00
		Clementine Rodgers	McGill	1000.00
		Winifred Jennings	McGill	1000.00
		Ruth Anderson	McGill	1000.00
		Ruth Mandell	McGill	1000.00
		Wilma Snowball	McGill	1100.00
		Marguerite McGraw	McGill	110.00
		Mrs. A. H. Oldman	McGill	100.00
		Mabel Rudesill	McGill .....	.....
Marcy	J. B. Dolan	Mrs. Eula McMullen	Aurum	100.00
Valley	Wm. Robinson	Winifred Smith	Via Eureka	70.00
Wilson	Chas. Rodgers	Mrs. Chas. Miller	Aurum	80.00

CLERKS OF SCHOOL BOARDS, AND TEACHERS—Continued

County and district	Clerk	Teachers	Postoffice	Salary
Willow Grove	Eva Allred	Harriett Boyd	Preston	\$100.00
Osceola	Jas. H. Marriott	Dormant	Osceola	
Pleasant Valley	Mrs. H. Bates	W. E. Hill	Parker	100.00
Preston	Nettie Bradley	J. R. Warne	Preston	115.00
		Mrs. J. R. Warne	Preston	115.00
Ruth	Arthur A. Shell	P. B. Westerman, Prin.	Ruth	1700.00
		Merle McCall	Ruth	1100.00
		Mrs. B. H. Shartle	Ruth	1100.00
		Manilla Rose	Ruth	1100.00
		Lucy L. Foster	Ruth	1150.00
Shingle Creek	E. B. Robison	Ruth Raymond	Osceola	90.00
Shoshone	Richard Swallow	Hazel Langenour	Shoshone	100.00
Siegel	H. L. Anderson	Mrs. Harry Rager	Shellbourne	115.00
Snake Valley	George Baker	Estelle Tyson	Baker	115.00
		Yerda Matson	Baker	115.00
State Line	Mrs. Eva Tweedy	Mrs. Margie Quate	Baker	100.00
Steptoe	Wm. Campbell	Lillian Meiss	Steptoe	100.00
Taft	John Yelland	Clara M. Anderson	Cleveland Ranch	100.00
Tippett	G. McCurdy	Dormant		
Melvin	John Magnuson	Dormant		
White River	Owen Casler	Artie Zedler	Preston	90.00
Robison	Jas. F. Robison	Ester J. Segalla	Osceola	100.00
County High School	B. L. Quayle	A. S. Kubitz, Principal	Ely	2700.00
		Clara G. Alexander	Ely	1500.00
		Helen Fliege	Ely	1400.00
		Emma Clyde	Ely	1400.00
		Inez Moore	Ely	1400.00
		Alma Jackson	Ely	1400.00
		H. V. Henderson	Ely	1400.00
County High School	B. L. Quayle	Mrs. H. K. Bieghler	Lund	1500.00
School of Mines	B. L. Quayle	V. M. Henderson, Prin.	Ely	2400.00

*Yearly salaries given when known; otherwise monthly.

†Clear of room and board.

Third Supervision District—Churchill, Humboldt, and Pershing Counties

County and district	Clerk	Teachers	Postoffice	Salary
CHURCHILL				
Consolidated B.	F. B. Meadley	L. E. McFadden, City Supt.	Fallon	\$2250.00
		Loria D. Smith, Principal	Fallon	120.00
		W. V. Hollan	Fallon	140.00
		Laura E. Mills	Fallon	100.00
		Ida Schultz	Fallon	120.00
		Irma Bendle	Fallon	100.00
		Adah Gerjets	Fallon	100.00
		Mrs. Lucy Burton, Prin.	Fallon	120.00
		Erma Patterson	Fallon	100.00
		Irma Musgrave	Fallon	100.00
		Gladys Jones	Fallon	105.00
		Laila N. Baker	Fallon	100.00
		Jessie F. Vann, Principal	Fallon	120.00
		Mrs. Effie Nutton	Fallon	100.00
Dixie	J. J. Mackedon	Mrs. Lillie Hall Stark	Dixie Valley	90.00
Harmon	Fred Nelson	Mrs. J. Hughes, Prin.	Fallon	95.00
		Hester Mills	Fallon	90.00
Hazen	Mrs. Francis C. Pyle	Thelma Bradshaw, Prin.	Hazen	110.00
		Cecilia Quilici	Hazen	100.00
Island	H. E. Smith	Mrs. Maud Reid	Fallon	90.00
Lone Tree	Mrs. Leota Moore	Mrs. Louise M. Roy	Fallon	90.00
Norham	Mrs. V. Fulkerson	Mrs. Daisy D. Lucas	Fallon	90.00
St. Clair	Mrs. J. W. Johnson	Theo Irene Smart	Fallon	120.00
Stillwater	C. B. Staup (Fallon)	Ethel Bartow, Principal	Stillwater	95.00
		Zarepha Bartow	Stillwater	90.00
Wonder	J. K. Henderson	Mrs. Grace B. Staples	Wonder	120.00
County High School	Mrs. M. H. Wallace	L. A. Pringle, Principal	Fallon	2500.00
		Elizabeth Coolidge	Fallon	120.00
		Clara E. Balmat	Fallon	135.00
		Georgia Damm	Fallon	180.00
		Violet Shepard	Fallon	140.00
		Grace E. Mitchell	Fallon	180.00
		R. W. Nutton	Fallon	160.00
HUMBOLDT				
Big Creek	H. H. Alexander	Caroline E. Melody	Jungo	\$95.00
Bottle Creek	Tilden Martin	Dormant	Amos	
Cane Springs	I. B. English	Iola Gillespie	Amos	100.00
Central	Gerhard Miller, Jr.	Flora A. Melendy	Winnemucca	85.00
Crossing	Wm. De Long	Frances Case	Sulphur	100.00
Denio	Charles Williams	Olive Roy	Denio, Oregon	

CLERKS OF SCHOOL BOARDS, AND TEACHERS—Continued

County and district	Clerk	Teachers	Postoffice	Salary
Dye	Dr. W. F. Boylan	Mrs. Clara C. Holloway	Amos	
Fort McDermitt	Dora Lasa	Mrs. Laura Frasier	McDermitt	\$100.00
Golconda	Mrs. G. W. Brady	Mrs. F. Lowry, Prin.	Golconda	100.00
		Marguerite Drumm	Golconda	85.00
Jackson Mountain	Mrs. Fred Hummel	Addie Canfield	Jungo	100.00
Jungo	Mrs. G. B. Austin	Agnes R. Roberts	Jungo	95.00
Kings River	Guadalupe Hurtado	Barbara Mensing	Rebel Creek	85.00
McDermitt	I. W. Minor	Marion F. Royce	McDermitt	110.00
McGhee	Ed. E. McGhee	Jessie E. Sears	Denio, Oregon	100.00
National	E. J. Lucas	Mrs. E. J. Lucas	National	110.00
Paradise	N. A. Gillilan	Fred L. Wood, Prin.	Paradise Valley	175.00
		Ruth Pritchett	Paradise Valley	100.00
Rosebud	George B. Noble	Mrs. Jeanette Bragg	Sulphur	100.00
River	Mrs. Helen Scott	Agnes Jensen	Platara	100.00
Sod House	J. M. Legarza	Nora M. Roberts	Amos	100.00
Stonehouse	J. W. Planck	Harry Kessel	Valmy	100.00
Winnemucca	T. M. Patten	Jessie I. Diamond, Prin.	Winnemucca	1800.00
		C. C. Trumble	Winnemucca	150.00
		Mrs. Carrie C. Bullis	Winnemucca	125.00
		Mrs. Ethel Kibbee	Winnemucca	125.00
		Minnie Bradshaw	Winnemucca	125.00
		Mrs. Janet B. McGovern	Winnemucca	125.00
		Madeline Horgan	Winnemucca	125.00
		Mrs. Cora M. Watt	Winnemucca	125.00
		Mrs. Jennie Smith	Winnemucca	125.00
		Theodate Etta McKay	Winnemucca	125.00
		Mrs. Annie T. Card	Winnemucca	95.00
County High School	T. H. Shone	J. D. Scott, Principal	Winnemucca	2400.00
		Olive Elizabeth Terrill	Winnemucca	120.00
		Gertrude Webb	Winnemucca	120.00
		Minnie S. Wolf	Winnemucca	145.00
		Dorothy Higgins	Winnemucca	120.00
		Lydia E. Colyer	Winnemucca	120.00
		Alva L. Walker	Winnemucca	180.00
		Karl Mitchell	Winnemucca	135.00
PERSHING				
Big Meadow	E. W. Sommer	Irene Snow	Lovelock	110.00
Bears Vista	A. S. Davidson	M. A. Leonard	Unionville	120.00
Bushee	W. L. Pearce	Grace S. Mills	Winnemucca	95.00
Chafey	Mrs. Thos. Hendra	Mrs. Mamie F. Seiber	Mill City	100.00
Crescent	Dormant			
Fairview	L. R. Bassman	Grace C. Sullivan, Prin.	Lovelock	110.00
		Freda Daoust	Lovelock	110.00
Fountain	R. E. Umber	Claire M. Pierson	Imlay	110.00
Imlay	Mrs. Clara S. Beatty	Mrs. M. L. Peterson, Prin.	Imlay	130.00
		Mrs. Julia Grant	Imlay	115.00
Lake	Mrs. Edna T. Foster	Clarence A. Britell, Prin.	Lovelock	185.00
		May Bowman	Lovelock	115.00
		Carice Smith	Lovelock	115.00
		Hattie Burnett	Lovelock	110.00
		Loretto S. Kenney	Lovelock	110.00
		Grace A. Fuss	Lovelock	115.00
		Helen O'Neil	Lovelock	110.00
Lower Rochester	A. E. Riordan	Berenice Stonestreet	Lower Rochester	100.00
Mill City	Mrs. H. F. Davidson	Bessie Fern Schlink	Mill City	110.00
Oreana	Geo. V. Stenger	Mrs. Geraldine B. Cessna	Oreana	100.00
Packard	John C. Rae	Mrs. Anne Garnier	Lower Rochester	100.00
Rochester	T. B. McNeely	Ethel Case	Rochester	130.00
Rosebud				
Star	N. C. Frendsen	Edith Mae Smith	Imlay	90.00
County High School	P. A. Quigley	Harold W. B. Baker, Pr.	Lovelock	2400.00
		Maybelle L. Hudson	Lovelock	135.00
		Zella Dorton	Lovelock	130.00
		Hazel I. Ziesenis	Lovelock	130.00
		Marie Benedict	Lovelock	125.00
		William Duddleson	Lovelock	183.33

*Yearly salaries given when known; otherwise monthly.

†See Humboldt County. Funds transferred, pending adjustment.

**Fourth Supervision District—Douglas, Lyon, Mineral, Ormsby,
Storey, and Washoe Counties**

County and district	Clerk	Teachers	Postoffice	Salary
DOUGLAS				
Centerville.....	W. H. Thrane	Dorothy Raycraft.....	Gardnerville.....	\$900.00
Central.....	J. H. Stodieck.....	Anna A. Heise.....	Gardnerville.....	990.00
Consolidated A.....	L. P. Jacobsen.....	Anna Barber, Principal.....	Gardnerville.....	1125.00
		Mrs. Kirstine Doane.....	Gardnerville.....	810.00
		Grace A. Harris.....	Gardnerville.....	810.00
		Josephine Helwinkle.....	Gardnerville.....	810.00
Consolidated B.....	J. A. Cardinal.....	Alice W. O'Brien.....	Minden.....	1125.00
		Lenore Boomhower.....	Minden.....	900.00
Douglas.....	Mrs. M. Schneider.....	Ethel Walker.....	Gardnerville.....	810.00
Fairview.....	Mrs. W. F. Dressler.....	E. J. Blowers, Prin.....	Genoa.....	900.00
Genoa.....	Mrs. Joe Campbell.....	Berenyce Moore.....	Genoa.....	855.00
		Mrs. Christina K. Harris.....	Gardnerville.....	855.00
Mottsville.....	William Hansen.....	T. S. Hook, Principal.....	Gardnerville.....	2600.00
County High School.....	Fred Settlemyer.....	C. L. Hargrave.....	Gardnerville.....	2200.00
		Nellie A. Vail.....	Gardnerville.....	1260.00
		Eva C. McCarthy.....	Gardnerville.....	1125.00
		Stella Van Dyke.....	Gardnerville.....	1260.00
LYON				
Artesia.....	G. M. Devereaux.....	Olive Durfee.....	Artesia.....	\$910.00
Barrett.....	Mrs. G. E. Batchelder.....	Alva M. Williams.....	Yerington.....	810.00
Bluestone.....	F. B. Miller.....	Dormant.....	Mason.....	900.00
Canal.....	W. C. Watson.....	Mrs. Alice R. Austin, Pr.....	Fernley.....	1170.00
		Hazel C. Murray.....	Fernley.....	1080.00
		Louella Murray.....	Fernley.....	1080.00
Central.....	C. K. Beaman.....	Mrs. Ella Hill.....	Wellington.....	810.00
Colony.....	Mrs. Helen Hendel.....	Arlie J. Jenson.....	Simpson.....	720.00
Churchill.....	Guilio Teglia.....	Mrs. Harriet L. Coleman.....	Dayton.....	660.00
Dayton.....	Fred M. Johnson.....	Jesse J. Beaty, Principal.....	Dayton.....	1000.00
		Mrs. Bertha E. Berger.....	Dayton.....	1000.00
		Frances Heidenreich.....	Yerington.....	765.00
Gallagher.....	Peter Gallagher.....	Adele Vallencour.....	Hudson.....	720.00
Grant View.....	Mrs. Theo Schneider.....	Ruth E. Carter.....	Ludwig.....	800.00
Ludwig.....	Roland Gibson.....	Mrs. Edith L. St. Cyr.....	Mason.....	855.00
Mason.....	E. L. Scott.....	Gertrude Wise, Principal.....	Mason.....	765.00
		Edna Schacht.....	Yerington.....	810.00
Meissner.....	Peter Henrichs.....	Evelyn D. Stock.....	Mound House.....	765.00
Mound House.....	Thomas Gracey.....	Margaret L. Vieira.....	Yerington.....	855.00
Perry.....	C. C. Perry.....	Anna L. Borge.....	Mason.....	720.00
Plummer.....	John McGowan.....	Mrs. Mae Tillay.....	Wabaska.....	640.00
Railroad.....	J. M. Feeney.....	Beatrice A. Belli, Prin.....	Wabaska.....	760.00
		Mrs. Theresa N. Smith.....	Yerington.....	640.00
Sanders.....	James Lancaster.....	Mrs. P. B. Karaus, Prin.....	Silver City.....	800.00
		Ethel Welch.....	Silver City.....	720.00
Silver City.....	Alex Armstrong.....	Mrs. M. McNamara, Prin.....	Thompson.....	1000.00
		Mrs. Laura F. Greeley.....	Smith.....	900.00
Smelter.....	J. H. Rose.....	Dormant.....	Sutro.....	720.00
Smith.....	Mrs. Carrie L. Tidd.....	Ada F. Pointer.....	Wabaska.....	800.00
Sutro.....	Mrs. Sarah Winnie.....	Frances Howard.....	Wellington.....	720.00
Wabaska.....	James O. Parker.....	Ann Gordon.....	Yerington.....	300.00
Wellington.....	Mrs. Minnie Hovey.....	Gladys E. Frazer.....	Yerington.....	1250.00
Yerington.....	George F. West.....	B. G. Bleasdale, Prin.....	Yerington.....	1100.00
		Mrs. Maud W. Johnson.....	Yerington.....	1000.00
		Dorothy Cousins.....	Yerington.....	1000.00
		Lora Lamberson.....	Yerington.....	1000.00
		Mrs. Elizabeth McKay.....	Yerington.....	1000.00
		Rita Bliss Keyser.....	Yerington.....	30.00
		Mrs. H. Grimmer (Music).....	Yerington.....	2500.00
County High No. 1.....	Mrs. J. L. Wilson.....	B. G. Bleasdale, Prin.....	Yerington.....	1250.00
		Anna E. Maxwell.....	Yerington.....	1600.00
		Almee Patterson.....	Yerington.....	1250.00
		Agnes Constable.....	Yerington.....	2200.00
		Willis Smith.....	Yerington.....	1400.00
County High No. 2.....	R. A. Trimble.....	Mrs. O. P. Riker.....	Dayton.....	2000.00
		Jesse J. Beaty, Principal.....	Dayton.....	1250.00
		Edith Clare Harris.....	Dayton.....	1500.00
County High No. 3.....	F. W. Simpson.....	Ruth Jones.....	Smith.....	1200.00
		Edna L. Greenough.....		
MINERAL				
Aurora.....	Mrs. Dale Jones.....	Mrs. Rosa Ewing.....	Sweetwater.....	\$840.00
Cambridge.....	Ambro Rosaschi.....	Dora Hill.....	Yerington.....	1125.00
East Walker.....	Mrs. Anna M. Moore.....	Mrs. Anna M. Moore.....	Wichman.....	920.00
Hawthorne.....	Mrs. J. Burkham.....	Wilhelmina Purcell, Prin.....	Hawthorne.....	1500.00
		Harriet Lowrey.....	Hawthorne.....	1400.00
Lucky Boy.....	B. J. George.....	Dormant.....	Hawthorne.....	
Luning.....	U. G. Wright.....	Jewel Webb.....	Luning.....	1215.00
Mina.....	Sol Summerfield.....	Elizabeth P. Smith, Prin.....	Mina.....	1350.00
		Irene Dunn.....	Mina.....	1350.00

CLERKS OF SCHOOL BOARDS, AND TEACHERS—Continued

County and district	Clerk	Teachers	Postoffice	Salary
Rawhide.....	C. W. Bafford.....	Hedvika Homola.....	Rawhide.....	750.00
Schurz.....	J. H. Bradford.....	Martha Gee.....	Schurz.....	900.00
Sweetwater.....	F. L. Yparraguirre.....	Bertha Jones.....	Sweetwater.....	1035.00
Simon District No. 1.....	Robert Painter.....	Mrs. Etta Stromer.....	Mina.....	1125.00
County High School.....	Mrs. Marie Stannard.....	U. W. Keplinger, Prin.....	Hawthorne.....	1900.00
		Sue Wilson.....	Hawthorne.....	1500.00
ORMSBY				
Carson City.....	Frank E. Meder.....	E. L. McKeown, City Supt.....	Carson City.....	\$2400.00
		HIGH SCHOOL		
		Laurence Hansen.....	Carson City.....	1400.00
		Blanch Lothrop.....	Carson City.....	1200.00
		Edith Wooldrige.....	Carson City.....	1500.00
		Florence Bray.....	Carson City.....	1350.00
		Marie Benjamin.....	Carson City.....	1350.00
		ELEMENTARY		
		Mrs. Martha Gleason.....	Carson City.....	1100.00
		Rose M. Jones.....	Carson City.....	1000.00
		Elizabeth Harcourt.....	Carson City.....	950.00
		Mary V. Belli.....	Carson City.....	900.00
		Mrs. Emma Benton.....	Carson City.....	950.00
		Lizzie Sanger.....	Carson City.....	1000.00
		Theresa Schulz.....	Carson City.....	900.00
		Alice E. Bryant.....	Carson City.....	1100.00
Clear Creek (Joint).....	Angelo Belmonte.....	School held in Carson City.....	Stewart.....	
Empire.....	J. W. Stevens.....	Mrs. Madge Raycraft.....	Carson City.....	1000.00
Lake View.....	Hiram Downs.....	Martha Patterson.....	Carson City.....	800.00
STOREY				
Derby.....	Mrs. P. Kiley.....	Albina C. Ginocchio.....	Derby.....	\$810.00
Gold Hill.....	Arthur J. Staricha.....	Mrs. Mary Whipple.....	Gold Hill.....	900.00
Virginia City.....	Joseph B. Kenny.....	H. O. Williams, Prin.....	Virginia City.....	2250.00
		HIGH SCHOOL		
		Ethel Winger.....	Virginia City.....	1500.00
		Milton Mallory.....	Virginia City.....	1350.00
		ELEMENTARY		
		Gladys Hicks.....	Virginia City.....	1000.00
		Marion C. McKenzie.....	Virginia City.....	1000.00
		Mrs. S. M. Frederick.....	Virginia City.....	1000.00
		Mrs. Katie G. Quirk.....	Virginia City.....	1000.00
		Mollie Somers.....	Virginia City.....	1000.00
		Dwight T. Smith, Prin.....	Virginia City.....	2000.00
School of Mines.....	Joseph B. Kenny.....			
WASHOE				
Anderson.....	Frances Frey.....	Adeline E. Savery.....	Reno, RFD 1.....	\$810.00
Boahams.....	J. W. Whitley.....	Dormant.....	Pyramid.....	
Browns.....	Mrs. J. S. Lyons.....	Mrs. Alma V. Branton.....	Steamboat.....	765.00
Cold Springs.....	A. P. North.....	Summer School 1920.....	Vya.....	
Francis.....	Mrs. Minnie North.....	Ruth LaKamp.....	Francis.....	700.00
Franktown.....	Mrs. W. F. Sauer.....	Ruth Randolph.....	Franktown.....	765.00
Galena.....	James Callahan.....	Dormant.....	Washoe.....	
Gerlach.....	W. S. Murdock.....	Mrs. Rose Rogers.....	Gerlach.....	855.00
Green Springs.....	Mrs. D. E. Hill.....	Mrs. Maud Clifford.....	Beulah.....	640.00
Consolidated H. W.....	J. H. Heward.....	Dora Lee Roberts.....	Gerlach.....	1350.00
Hansen.....	W. E. Dorton.....	Dormant.....	Eagleville, Cal.....	
Hoffakers.....	J. L. Hash.....	Minnie Savery.....	Reno, RFD 1.....	900.00
Glendale.....	Charles Jones.....	Mrs. Mabel James.....	Reno, RFD 2.....	900.00
Lamington.....	R. T. Smith.....	Mary A. Henry.....	Laughton.....	
Meadowview.....	Mrs. J. F. Perry.....		Vya.....	
Mill Station.....	Mrs. Letitia Foust.....	Mrs. Ethel Zimmer.....	Franktown.....	675.00
North Truckee.....	A. N. Gault.....	Ruth E. Leon.....	Reno, RFD 2.....	945.00
Olinghouse.....	Mrs. Emma Dallimore.....	Mrs. J. F. Blanchard.....	Olinghouse.....	80.00
Pyramid.....	Mrs. A. J. Olds.....	Ada Sharkey.....	Constantia, Cal.....	700.00
Red Rock.....	Alex Geraldo.....	Mrs. Zella P. Geraldo.....	Constantia, Cal.....	900.00
Reno.....	Theo W. Clark.....	B. D. Billingshurst, City Superintendent.....	Reno.....	4000.00
		HIGH SCHOOL		
		E. Otis Vaughn, Prin.....	309 W. Fourth St.....	2600.00
		Agnes Bell.....	710 Sierra St.....	1500.00
		Kathryn Taylor.....	746 N. Virginia St.....	1500.00
		Alma Boeke.....	759 N. Virginia St.....	1500.00
		Effie Mack.....	428 Hill St.....	1500.00
		Alwine Sielaff.....	317 Maple St.....	1500.00
		Eva M. Sinn.....	747 N. Virginia St.....	1500.00
		Ethel Pope.....	415 Elm St.....	1500.00
		Helen M. Smith.....	820 N. Center St.....	1400.00
		Ina Meredith.....	Colonial Apts.....	1400.00
		Vera B. Ames.....	Colonial Apts.....	1500.00

CLERKS OF SCHOOL BOARDS, AND TEACHERS—Continued

County and district	Clerk	Teachers	Postoffice	Salary *
Reno (continued)	Theo W. Clark	Gladine Tuller	745 Center St.	1400.00
		Mrs. Anna C. Loomis	423 W. Sixth St.	1300.00
		Anna C. Taylor	205 Maple St.	1500.00
		Zetta Underwood	983 Sierra St.	1500.00
		Harriett White	304 Robert St.	1300.00
		Bernice Crosby	437 N. Chestnut	1300.00
		Milla Coffin	231 W. Fifth St.	1200.00
		Frank Palmer		1800.00
		Harold Field	119 West St.	1700.00
		Levant Thompson		1800.00
		Smith-Hughes Work—		
		Helen Hobbins	829 N. Virginia St.	375.00
		C. H. Kent		1000.00
		Military—		
		Major Douglas J. Page		
		Special for Grades—		
		Maye Gonterman	746 N. Virginia St.	1250.00
		Weltha J. Beecher		1300.00
		B. M. Hansen		1450.00
		ELEMENTARY		
		Orvis Ring—		
		Mrs. L. C. Booth, Prin.	421 Sierra St.	1500.00
		Pearl Stinson	423 Sinclair St.	1100.00
		Francis Wright	753 N. Center St.	1200.00
		Laura B. Miller	220 Elm St.	1200.00
		Mrs. C. H. Luke	420 N. Virginia St.	1200.00
		Helen Hanley	722 Holcomb Ave.	1000.00
		Helene Banta	418 Maple St.	1200.00
		Elizabeth McCormack	329 Mill St.	1200.00
		Georgiana Steiner		900.00
		Mrs. J. K. Logan	115 Mill St.	1200.00
		McKinley Park—		
		Lucy Parker, Prin.	201 Vine St.	1500.00
		Matilda Feretti	142 Vine St.	1200.00
		Elsie Farrar	407 W. Fifth St.	900.00
		Mrs. Pearl Dominguez	923 W. Second St.	1000.00
		Georgia MacNair	705 N. Virginia St.	1200.00
		Katherine Rannella	516 West St.	1200.00
		Agnes Morris	Colonial Apts.	1200.00
		Emilie Yparraguirre	332 W. Fourth St.	1200.00
		Mary S. Doten—		
		Echo Loder, Principal	405 W. Fourth St.	1500.00
		Sarah Chase	630 Alameda Ave.	1200.00
		Lottie M. Clark	1021 N. Virginia	1200.00
		Estelle Prouty	126 W. Tenth St.	1200.00
		Marie Lloyd	716 Humboldt St.	1200.00
		Emma N. Smith	311 W. Fifth St.	1200.00
		Ina Powers	828 N. Virginia St.	1100.00
		Gertrude Shade	Colonial Apts.	1100.00
		Rachel Vann		1000.00
		Southside—		
		Frances Frey, Prin.	Reno, RFD 1	1500.00
		Edith Hurd	339 W. First St.	1200.00
		Margaret Hinch	517 E. Sixth St.	1200.00
		Mary Harrington	339 West St.	900.00
		Florence Shirley		1100.00
		Alpha Rulison		1000.00
		Agnes Maxwell	217 E. Taylor St.	1200.00
		Vyvan Read	Vassar St.	1000.00
		Jessie Beck	619 Sinclair St.	1200.00
		Elvina Blevens	255 W. Terrace St.	1000.00
		Kindergarten—		
		Maud B. Bishop	746 N. Virginia St.	1000.00
		Mt. Rose—		
		Boulah Morgan, Prin.	447 Nevada St.	1500.00
		Isabel Bertschy	519 Humboldt St.	1000.00
		M. Pearl Duncan	841 N. Virginia St.	1200.00
		Hazelbelle Fowler		1000.00
		Gertrude Tailleir	918 W. Second St.	1100.00
		Grace Carson	407 W. Fifth St.	1000.00
		Alice Meffley	304 W. Sixth St.	1200.00
		Kindergarten—		
		Winifred Cockrell	747 N. Virginia St.	1100.00
		Ethel Skemp	220 Maple St.	1000.00
		Mildred Levy	471 Granite St.	900.00
Rye Patch	Charles T. Smith	Attending Gerlach School	Sunkist	
Salt Marsh	Mrs. W. Parker	Louise Forward	Sheepshead	95.00
Silver Lake	Mrs. William Welch	Dormant	Reno	
Smoke Creek	Mrs. Marian Elder	Dormant	Sand Pass	
Spanish Springs	George Blundell	Mrs. Clara Patterson	Sparks	700.00

CLERKS OF SCHOOL BOARDS, AND TEACHERS—Continued

County and district	Clerk	Teachers	Postoffice	Salary *
Sparks	Mrs. Edna Baker	C. H. Meeker, City Supt. M. P. Sherman Mrs. Hazel Moore Mrs. Elizabeth Brower Lucile E. Ames Edith S. Harris J. T. Perigo Algot E. Anderson	Sparks Sparks Sparks Sparks Sparks Sparks Sparks Sparks	 \$1500.00 1300.00 1300.00 1250.00 1300.00 1350.00 1400.00
		GRAMMAR		
		Maud Frazier, Principal Mrs. P. E. Groesbeck Ina Estes Hubbard Alice Maxwell Ysabel S. Rising Selma Sielaff Anna J. Rieve Bonnie Stephens Mrs. Florence A. Drake Mary Lukens Ann P. Cossallo Mrs. Mary M. Sherman Agnes Lucey Dana Shoptaugh Smith-Hughes Work— H. T. Smith†	Sparks Sparks Sparks Sparks Sparks Sparks Sparks Sparks Sparks Sparks Sparks Sparks Sparks Sparks Sparks	 1500.00 1100.00 1150.00 1150.00 1200.00 1000.00 1100.00 1100.00 1100.00 1100.00 1100.00 1100.00 1050.00 1100.00 1188.00
Snow Valley	C. W. Fisk	Lillian Fauchet	Sparks	1188.00
Twin Springs	E. J. Sharp	Maude Jacob	Gerlach	765.00
Verdi	J. A. Swanson	Cecilia Meighan, Prin. Mrs. Louella Raper Mrs. A. Belle McMillan	Vya Verdi Verdi Verdi	720.00 1400.00 1000.00 1000.00
Vista	F. J. Fairchild	Mrs. Margaret Evans	Reno, RFD 2	800.00
Wadsworth	John Monte	Mrs. Mary Bray, Prin. Mrs. M. H. Kohler	Wadsworth Wadsworth	1215.00 990.00
Washoe	F. J. Sauer	Rose Taverna	Washoe	675.00

*Yearly salaries given when known; otherwise monthly. †Children attending Carson school. ‡Part time. †Paid by Federal Government.

Fifth Supervision District—Clark, Esmeralda, Lincoln, and Nye Counties

County and district	Clerk	Teachers	Postoffice	Salary *
CLARK				
Educational No. 1 Bunkerville	W. H. Lyons	A. L. Kelley, Supt. Della Miles Lea Leavitt Mary Woodberry	Overton Bunkerville Bunkerville Bunkerville	\$2700.00 125.00 95.00 90.00
Bunkerville High School		L. R. Hafen, Prin. L. W. Harmon Wilma Miles Chas. Hafen Mrs. L. R. Hafen	Bunkerville Bunkerville Bunkerville Bunkerville Bunkerville	2100.00 153.88 138.88 133.33 133.33
Mesquite		Geo. H. Bowler, Prin. Charity Leavitt Percilla Leavitt Emma Abbot	Mesquite Mesquite Mesquite Mesquite	125.00 90.00 90.00 90.00
Moapa		Irene Hill	Moapa	115.00
Overton		Mrs. Lea Shurtliff Georgia Watts Mary Lihjenquist W. J. Flowers	Overton Overton Overton Overton	95.00 1000.00 90.00 100.00
Overton High School		E. L. Lihjenquist, Prin. Miriam Rogers Herman Stucki Dorothy Cook Agnes Clive	Overton Overton Overton Overton Overton	2100.00 1250.00 1600.00 1275.00 1440.00
St. Thomas		Margaret H. Stark Anna Arnold Mrs. Hollewell	St. Thomas St. Thomas St. Thomas	125.00 95.00 95.00
Enterprise	W. S. Cropper	Johanna Sullivan	Arden	110.00
Goodsprings	H. C. Lamott	Florence Doherty	Goodsprings	125.00
Jean	H. C. Lamott	Heleen Robins	Jean	110.00

CLERKS OF SCHOOL BOARDS, AND TEACHERS—Continued

County and district	Clerk	Teachers	Postoffice	Salary
Las Vegas	E. H. Hunting	R. H. McPeak, Principal. Dixie T. Smith. Rachel Beach. Kate Skeede. Thelma C. Johnson. Katarine Casey. Oliva Jewell. Dora E. Lee. Katharine Davis. Ethel Ellis. Winifred Gardner. Addison H. Gibson. Mrs. Mamye T. Smith. George T. Beach, Prin. J. F. Mayce. Helen E. Mace. Lottie Ward. Donna Dyke.	Las Vegas. Las Vegas. Las Vegas. Las Vegas. Las Vegas. Las Vegas. Las Vegas. Las Vegas. Las Vegas. Las Vegas. Las Vegas. Goodsprings. Searchlight. Las Vegas. Las Vegas. Las Vegas. Las Vegas. Las Vegas.	\$1850.00 1100.00 1100.00 1100.00 1100.00 1100.00 1100.00 1100.00 1100.00 1100.00 1100.00 120. 125. 2500.00 226.67 1306.00 1306.00 1306.00
Sandy	V. C. Freelove.			
Searchlight	Walter M. Brown			
County High School	Helen J. Stewart			
ESMERALDA				
Blair Junction	W. D. Howard	Eugenia Shelby	Blair Junction, via Silver Peak	100.00
Clayton	F. A. Vollmar	Helen C. Kinsella	Silver Peak	120.00
Columbia	Mrs. T. F. May	Rita A. Cannan	Columbia	1300.00
Dyer	J. A. Molini	Mrs. Mary T. Lowrey	Dyer	100.00
Goldfield	E. F. Dempsey	A. W. Armitage, City Supt.	Goldfield	2400.00
HIGH SCHOOL				
		G. E. Hofmann	Goldfield	500.00
		Elizabeth D. Bailey	Goldfield	1500.00
		Charlotte M. Palmer	Goldfield	1450.00
		Irma Haskell	Goldfield	1500.00
		Neil Kerrigan	Goldfield	1500.00
ELEMENTARY				
		Elsa Von Dornum	Goldfield	1400.00
		Margaret E. Nicholas	Goldfield	1300.00
		Nellie F. Burke	Goldfield	1250.00
		Mary T. Falvey	Goldfield	1300.00
		Viola M. Blevins	Goldfield	1300.00
		Agnes M. Duffy	Goldfield	1300.00
Hornsilver	Mrs. M. W. Mitchell	Frances Annette Carl	Hornsilver	100.00
Lida Valley	Mrs. F. Kitchen	Elsie Simpson	Lida, via Goldfield	100.00
Millers	J. J. Ramsey	Mrs. J. L. Greenough	Millers, via Tonopah	130.00
White Mountain	Mrs. S. R. Kennedy		Dyer	120.00
School of Mines	E. F. Dempsey	G. E. Hoffmann	Goldfield	2400.00
LINCOLN				
Alamo	S. U. Stewart	Emma Richards	Alamo	
		M. Brown	Alamo	
Bullionville	Mrs. J. C. Conway	Margaret A. Lytle	Caliente	100.00
Caliente	J. L. Denton	Anna Rickerich, Prin.	Caliente	1350.00
		Irma Weiser	Caliente	990.00
		Geneva Bean	Caliente	900.00
Camp Valley	F. R. Donahue		Ursine	
Carp	C. Maby	Pearl Johnson Huston	Carp, via Moapa	100.00
Clover Valley	L. C. Wood		Joseco	
Deer Lodge	M. Damron		Fay	
Eagle Valley	Jos. Hammond	M. Cushionbury	Ursine	110.00
Flat Noe	Mrs. Paul Succetti	Mellicent Benesh	Pioche	100.00
Geyser	J. F. Wambolt	Matilda Brochu	Pioche	85.00
Groom Mine		Dormant	Indian Springs	
Highland	J. B. Wheeler	Jane Heaps	Pioche	90.00
Hiko	Ella Schofield	W. W. Schofield	Hiko	125.00
Kiernan	Mrs. W. Bradshaw	Etta M. Mariger, Prin.	Elgin	100.00
		Ethel Hardy	Elgin	100.00
Panaca	Mrs. Rose Higgins	Amy Briley, Principal	Panaca	125.00
		Rora C. Wadsworth	Panaca	110.00
		Elizabeth Tracey	Panaca	115.00
		Lettian Tracey	Panaca	115.00
Pioche	Dr. W. W. Stockham	Winnie M. Thomas, Prin.	Pioche	150.00
		Gladys Pannier	Pioche	125.00
		Effa Frances	Pioche	125.00
		Laura Stephens	Pioche	125.00
Prince Mine	Nelson Baker	Katherine Jurgens	Pioche	90.00
Red Rock	John Acklin		Caliente	
Richard	Jas. Sharpe	Oretta Allen	Alamo	85.00
Rose Valley	Pat Devlin	J. Marjorie Cross	Pioche	100.00
Spring Valley	David Francis	Robbie Louise Stewart	Ursine	100.00
Weines Creek	Wm. Garrison	Leo W. Arries	Pioche	100.00

CLERKS OF SCHOOL BOARDS, AND TEACHERS—Continued

County and district	Clerk	Teachers	Postoffice	Salary
County High School	James Wadsworth	H. A. Whiteneck, Prin. Erastus A. Hansen Karl Banks Evelyn LaKamp Stanley Johnson	Panaca Panaca Panaca Panaca Panaca	\$2100.00 1200.00 1500.00 1200.00 1500.00
NYE				
Beatty	David Simson	Louisia Andrews Fox	Beatty	100.00
Belmont	G. E. Hughes	Lily M. Williams	Belmont	100.00
Blue Springs	W. C. Smith		Millet	
Carrara	J. P. Bishop		Carrara	
Charleston	F. A. Buel	Eleanor Merrow	Pahrump	90.00
Cherry Creek	Chas. Stevens	Ethel Farrel		
Currant	Jon Cazier	Mrs. John F. Lichlyter	Currant	100.00
Duckwater	Mrs. Ruth R. Irwin	Grace Clendenning	Duckwater	100.00
Dutch Flat	Sam C. Worthington	Mrs. Adeline L. Bryan	Austin	90.00
Garden Valley	Wm. Ferguson	Mrs. Egge Saxton	Sunnyside	100.00
Gardner	Mrs. A. B. Gardner		Sunnyside	
Hot Creek	G. L. Dugan	Hilda Peck	Hot Creek	125.00
Ione	R. C. Johnston	Mary Landers	Ione	100.00
Italian	Mrs. S. R. Bordoli	Anna Oudila (Resigned)	Sharp	90.00
Kaiser (Blue Eagle)	G. L. Sharpe	Mrs. M. Peterson	Currant	100.00
Manhattan	Wm. McClure	May B. Chase, Prin. Ida J. North Eula McMullen	Manhattan Manhattan Manhattan	175.00 175.00 150.00
Old Reveille Mill	Mrs. M. Peterson	Pauline Dunn	Bellhelen	110.00
Pine Creek	G. L. Welch	Emma Greer	Sharp	100.00
Pioneer	F. A. Milliken	Dorothy E. Williams	Pioneer	110.00
Reese River	J. F. Bowler		Austin	
Rhyolite		Dormant		
Riordan	J. C. Riordan	Lillian Murphy	Lund	60.00
Reed		Grace Lamb	Reed	115.00
Round Mountain	J. D. Harrington	Mrs. Katherine Shaw	Round Mountain	130.00
		Pauline Marcotte	Round Mountain	130.00
Success	Georgie Bell	Mrs. L. Thompson	Death Valley	90.00
Sunnyside	J. L. Whipple	Mrs. O. V. Siegle	Sunnyside	100.00
Tonopah	Thos. Lynch	G. L. Dilworth, City Supt.	Tonopah	3600.00
HIGH SCHOOL				
		Victor W. Jones	Tonopah	1800.00
		Realo H. Havenor	Tonopah	1800.00
		Mamie Sullivan	Tonopah	1650.00
		Mrs. Mary T. Hobson	Tonopah	1320.00
		Ruth Murray	Tonopah	1620.00
		Katherine Murphy	Tonopah	1650.00
		Elizabeth Jacobson	Tonopah	1800.00
		Agnes R. Jewitt	Tonopah	1800.00
		Blanche Winham	Tonopah	1485.00
		Katherine Swart	Tonopah	1500.00
ELEMENTARY				
		Helena Slavin	Tonopah	1620.00
		Anna E. Bradley	Tonopah	1620.00
		Martha B. Nesbitt	Tonopah	1500.00
		Ruby Schroeder	Tonopah	1500.00
		Sarah Gooch	Tonopah	1375.00
		Myrtle Brown	Tonopah	1380.00
		Ellen E. Sheerin	Tonopah	1500.00
		Rowene Lacque	Tonopah	1375.00
		Ivy Cross	Tonopah	1500.00
		Mildred Twomey	Tonopah	1265.00
		Irene Lamb	Tonopah	1440.00
KINDERGARTEN				
Twin Springs	Mrs. E. R. Allred	Marian Phillips	Tonopah	1265.00
Tybo	Irene Ferrel	Mrs. H. Reischke	Tonopah	100.00
School of Mines	Thos. Lynch	Mary Conner	Tybo, via Tonopah	125.00
		E. R. Bennett, Prin.	Tonopah	2400.00

*Yearly salaries given when known; otherwise monthly.



BEFORE THE PUBLIC SERVICE COMMISSION OF NEVADA

IN THE MATTER OF THE APPLICATION OF THE RENO
TRACTION COMPANY, A CORPORATION, FOR
PERMISSION PERMANENTLY TO DISCONTINUE SER-
VICE OVER CERTAIN OF ITS LINES WITHIN THE
CITY OF RENO.

CASE No.
C-533

CITY COUNCIL OF RENO, *Complainant,*
AND
CITY OF SPARKS, *Complainant,*
v.
RENO TRACTION COMPANY, A CORPORATION,
Respondent.

CASES Nos.
C-496, C-497

Hearings and Conferences Held
March 22, 1919, May 31, 1919, September 24, 1919,
October 8, 1919, October 24, 1919,
in Reno, Nevada.

APPEARANCES:

J. F. SHAUGHNESSY, *Chairman,*
W. H. SIMMONS, *Commissioner,*
J. G. SCRUGHAM, *Commissioner,*
For the Commission;

W. D. JONES, *City Attorney,*
LEROY F. PIKE, *City Attorney,*
F. J. BYINGTON, *Mayor,*
H. E. STEWART, *Mayor,*
For the City Council of Reno;

FRANCIS CUNNINGHAM, *City Attorney,*
C. N. CHENEY, *Mayor,*
For the City of Sparks;

C. J. GOODELL, *Attorney,*
A. N. BALDWIN, *Secretary,*
For the Reno Traction Company;

P. A. MCCABEAN, *Attorney,*
A. GRANT MILLER, *Attorney,*
PAUL L. ROSS, *Assemblyman from Washoe County,*
CHARLES GORMAN, *Chairman,*
JOHN T. READ, *Member,*
CHARLES H. BURKE, *Member,*
ROBERT L. FULTON, *Member,*
For the Citizens' Committee.

OPINION AND ORDER

SCRUGHAM, *Commissioner*:

The issues here under consideration are raised by the application of the Reno Traction Company, hereinafter called the company, for permission under section 36½ of the Public Service Commission Act, approved March 28, 1919, to discontinue service upon certain portions of its system within the City of Reno, known as the Second-Street line and the Burke's Addition and University lines. In this behalf the company shows that it is a corporation organized and existing under the laws of the State of California, and that it operates a street-railway line within the City of Reno and an interurban line between the City of Reno and the City of Sparks, in the State of Nevada, and has so operated said lines for upwards of ten years last past; and, finally, that for more than five years last past, it has operated all of said lines at a loss and has not during said time had sufficient revenue from its system to pay the cost of operation, taxes, maintenance and depreciation on its property and equipment, interest on its bonded indebtedness, and its share of street-repair work in the City of Reno, and that the operation of said system never has yielded the stockholders of said corporation any interest or income whatsoever upon their investment.

There is included by a stipulation of record in the hearing taken upon this application at Reno under date of September 24, 1919, the issues raised in consolidated Cases 496 and 497, City Councils of Reno and Sparks v. Reno Traction Company, yet undecided, wherein complaint is made and was on March 22, 1919, heard before the Commission sitting at Reno. At this hearing it was shown that the Traction Company was operating and maintaining its cars in a manner dangerous to the traveling public and with annoyance and inconvenience to the inhabitants of said two cities, in that cars were being operated without headlights or fenders and with worn condition of gearings, motors, trolleys, brakes and bearings and that the electric equipment was in poor and dangerous condition.

Hearings before the Commission at Reno have been held in these cases as follows: March 22, 1919; May 17, 1919, when conference was held with the City Council of Reno and representatives of the company; September 24, 1919; October 8, 1919; and October 24, 1919, when hearings were held upon the application of the company to discontinue the operation of certain portions of its lines within Reno.

CAPITALIZATION

The capitalization of the company as reported to the Public Service Commission is given at \$1,000,000 in stock authorized and \$1,000,000 in bonds authorized, of which there is \$100,000 in bonds issued and owned by the stockholders, while there is outstanding in the hands of private investors \$36,000 in bonds. The company failed to put in specific evidence as to the value of the property, but estimated that it could not be built at this time for less than \$250,000. The line of railway operated comprises approximately seven miles of track, three miles of which may be credited to the Reno street-car service and the balance to the Reno-Sparks interurban service.

During the past summer the company, because of the high cost of

living, was required to increase the wages of its motormen, conductors and other employees approximately 40 per cent and, therefore, as a result the net income of the company for ensuing periods will not be as good as it has been in the past. For the years 1918 and 1919, paving expenses levied by the City of Reno, and which theretofore had been running on an average of \$5,000 per annum, were not incurred because of war economies. If this street-paving expenditure is required of the company, together with the increased cost of labor, it is obvious that the company will show a very substantial deficit for the future. The company undertakes to save itself in so far as it can by proposing that it be permitted to abandon the operation of the Reno city street-car lines, which, for the past five years, have been operated at a substantial loss. But, in response to this proposal, a petition of protest signed by certain property owners was filed at the hearing before the Commission, on September 24, against abandoning the operation and the service rendered by these lines. These protestants set out that abandonment of service would tend to decrease the rental- and sale-value of residence properties within different districts served by the lines, to the extent of a large sum of money; and, further, that if the street-car system of Reno is abandoned it will be a step backward.

From the testimony introduced it was shown that the total earnings of the Reno city lines for the year 1918 were \$9,714.60; the operating expenses of the city lines alone were \$17,834.57. When to this expense is added taxes, interest on indebtedness, etc., of \$3,489.63, and the various items involved are carefully analyzed, it becomes obvious that it is impracticable from the point of view of either the interest of the public or that of the Traction Company to continue operation of the city car lines. Furthermore, the cost of putting the existing system of city lines into a safe and proper condition appears to be absolutely prohibitive, even if the fares and patronage were sufficiently increased to pay the normal operating expenses.

The petition of the Reno Traction Company for a discontinuance of such city service will, therefore, be granted, effective January 15, 1920.

In the matter of Cases 496 and 497, filed by the City Council of Reno, Nevada, and the City of Sparks, Nevada, respectively, against the Reno Traction Company, alleging poor and dangerous condition of poles, wires, track, road-bed and equipment maintained and operated by the company in and between the City of Reno and the City of Sparks, the Commission finds that the allegations are well founded. This poor and unsafe condition is due to lack of maintenance and can be partly attributed to the fact that during the past few years the world-wide market shortage has made it very difficult to obtain the necessary supplies and material for the proper upkeep of the property and equipment. However, the war period is now past and with diligent effort the required equipment and material should be obtained, therefore the Commission will direct that the Reno Traction Company shall exercise the utmost diligence in repairing and renewing the poles, wires, track, road-bed, rolling stock and other equipment of the company maintained and operated in and between the City of Reno and the City of Sparks to conform to the standard street-railway practices for lines of this character.

The Commission will further order and direct that the Reno Trac

tion Company shall maintain for the future such property and equipment in a safe and efficient condition. If any question arises as to the meaning of the term "standard street-railway practice" or "a safe and efficient condition," the Commission will exercise the right to rule on the specific points at issue.

In connection with Cases 496 and 497, the Commission will reserve jurisdiction for the purpose of making such further orders as may be necessary to effectuate the aforementioned improvements on the traction system.

An order will be entered in conformity with the views herein expressed.

I concur: W. H. SIMMONS.

DISSENTING OPINION

SHAUGHNESSY, *Chairman* (dissenting):

I am unable to agree with the majority opinion for the reason primarily that I am not willing to authorize the Traction Company to discontinue operation of its Reno city lines until it has been shown beyond a reasonable doubt that the public, after being fully informed, will not adequately support the road. The company undertakes to save itself in so far as it can by proposing that it be permitted to abandon the operation of its Reno city lines, but, generally speaking, I feel that a line having been built, equipped and put into operation between points where it is rendering an essential public service, should not be abandoned until after the people have been given an opportunity to make operations successful through the medium of increased rates and patronage if necessary, and the company has been required to rehabilitate and modernize its facilities where by so doing substantial economies in operation can be effected; and this is especially true if, by such cooperative action, an essential public service can, for the future, be maintained and improved.

EARNINGS, INCREASED EXPENSES AND VALUATION

The Reno city car lines are not earning sufficient to pay the operating expenses and taxes at the present time and have not done so for the past several years. In this behalf it may be noted from the earnings and expenses placed in evidence for the years 1915, 1916, 1917, 1918, and 1919, based on eight months ending August 31, that the company has, after paying operating expenses and taxes and carrying \$3,000 per year for the years 1918 and 1919 to depreciation reserve, incurred a loss amounting to an average of \$9,173 per year, or a total of \$45,865 on said city lines for said five-year period; but, as opposed to this, and taking the system as a whole, the net earnings have amounted to an average of \$4,449 per year, or a total of \$22,249 for said five-year period. In connection with this financial statement, however, it must be recognized that during the past summer the company, because of the high cost of living, found it only just and fair to increase the wages of its motormen, conductors and other employees approximately 40 per cent and that therefore the net income of the company for its system as a whole for ensuing periods, assuming that the cost of materials and supplies remain on the present war basis, will not be as good

as it has been in the past. In fact, this may have the effect of practically wiping out the net earnings entirely. Further, paving expenses levied by the City of Reno as provided for by franchise have been heavy during past years and for the future it is conceded that this cost will not be less than \$5,000 per annum. With the aforesaid increase in the cost of labor, plus the paving costs, if required for the future, it is obvious that the company will not be able to make ends meet for the future and therefore, if the people of Reno and Sparks are to have an adequate street-railway service for the future, a remedy should be found and applied. This is manifestly true without regard to what the fair property or investment valuation may be at this time. In this behalf it may be stated that the company has failed to report to the Commission or to put in evidence in these cases any testimony covering either the actual investment or the fair value of the property in its present condition. On the basis of the average net earnings of \$4,449, during the aforesaid five-year period, it may be stated that the commercial value of the property, if capitalized at 6 per cent, would be approximately \$75,000, but, for the reasons before stated, this net income may, for the future, be wiped out, and, therefore, there is no reliable "earning basis" upon which an estimate of value can be measured. Considering the service facilities, such as they are, the property probably could not be reproduced in its present condition for less than \$15,000 per mile, or a total of \$105,000 for the seven-mile system.

IN RE RENO CITIZENS COMMITTEE

During the hearings, a committee of representative Reno citizens was formed and was represented by counsel. They appeared as protestants against the granting of the company's application and strongly maintained that the abandonment of service on the city lines would take from the people of Reno and Sparks an essential service which should be maintained, and that its effect would be to destroy an essential public service, while at the same time heavily decreasing the rental- and sale-value of residence property within different districts of the city served by the lines; that, if the street-car system of Reno is abandoned, it will be a step backward; that said paving assessments, amounting to approximately \$5,000 per year as aforesaid, should not be charged against the company, but, instead, should be raised from general taxation of all property within the city limits; that, should the company remove its tracks, the cost of paving the streets would in no wise be reduced and the city would in any event be required to assume this obligation; that the removal of the city street-car lines or the abandonment of service would be a catastrophe to the city; that its effect on the morale of the city would become apparent almost at once; that in addition to the direct influence on real estate rental- and sale-values, it would affect the city's credit in selling bonds for the improvement of the city for the future; and that it would affect the growth of the city by causing capital to hesitate before investing, on the ground that the city was going backward instead of forward.

I concur in these views, because, on the quality and continuance of the transportation service in question largely depend the prosperity, growth, and importance of the cities and their additions which are served, and therefore the abandonment of the city lines carries with it

a heavy loss in prestige to Reno and in values to its property owners and taxpayers. Further, because the property of all taxpayers within the city is benefited by the continued operation and improvement of a modern street-car service, it should fairly be required by taxation to take care of all street paving instead of placing such burdens on the car patrons in the form of reduced service facilities and increased rates. When spread over an assessment valuation of all property within the city—approximately \$15,000,000 for 1920—manifestly the amount raised for said purposes will not only be wisely expended but at the same time will be only a trifling addition to each tax bill.

**IN RE COOPERATION AND PUBLIC TRANSPORTATION NECESSITY,
CONVENIENCE AND VALUE**

In my judgment the real question is not one of aiding the street-railway company or of placing any unreasonable burden upon the people, but rather it is one of retaining essential public-service facilities for the benefit of the city and the residents of Reno and Sparks, and, in order to accomplish this result, the important thing to bring out and maintain—and this is entirely aside from alleged and actual shortcomings which a searching analysis may develop—is thoroughgoing cooperation on the part of the public, the local authorities, and the railway company. Such cooperation is of much more importance to the communities served than to the railway, which, because of indifference and lack of adequate support, may discontinue operations and move its plant to more profitable fields. The mutual benefit and welfare of the people and the cities of Reno and Sparks and of the Traction Company are at stake in this proceeding when all matters are fairly considered. For example, Reno is naturally interested in making attractive and serviceable to the citizens of Sparks, who desire and enjoy the benefit of the University, and the shopping and amusement opportunities afforded by the metropolis of Nevada, a high-grade transportation service. At present approximately five hundred citizens, based on those who use street-car service, are interchanging residence and occupation within these two cities. In other words, they live in one and work in the other and ride to and from their work daily on the Traction Company's lines. These patrons are granted a 5-cent fare by the purchase of monthly books for \$3, covering transportation in either direction morning and evening and limited to the month for which sold, whereas the cash fare between said cities of Reno and Sparks is 10 cents in each direction. Compared with these charges, it may be noted that the fare between Reno and Sparks on the Southern Pacific lines is 15 cents in each direction. In connection with the aforesaid cash fares and monthly book rates, free transfers are issued by the company to its Sparks and Reno patrons to and from all sections of Reno served by the street-car lines, including the Nevada Interurban Railway for service from Reno to Moana Springs and points intermediate. In this behalf, I understand that there is a substantial number of such transfer services rendered daily. The public necessity and convenience of this street-car line service may therefore be made clear by the statement that under the company's generous plan of operation a patron may make a journey from Sparks to Reno either under the 10-cent cash fare or the 5-cent monthly book rate and then by said free transfer

privilege reach any portion of Reno served by the city car lines. Likewise, a Reno patron living in the Burke's Addition or at the end of the Second-Street line or in the University section of the city is, under said present rates and transfer privileges, assured of a joint city and inter-urban line service from said points all the way to Sparks.

MOANA SPRINGS INTERURBAN RAILWAY CONNECTION AT RENO PUT OUT OF BUSINESS

In addition to what is said above, it is important to keep in mind that the Nevada Interurban Electric Railway, operating a two-mile line between Reno and Moana Springs, a bathing and pleasure resort, uses the Reno Traction Company's line for transportation and depot service into and out of Reno between California and Second Street. Abandonment of the city lines authorized by the majority decision in this case will very seriously injure said Interurban Railway, if it does not in fact have the effect of putting it out of business, thus destroying the direct and transfer public service which is now rendered to the people of Reno and Sparks.

IN RE AUTO-BUS LINE SERVICE INDEPENDENTLY OPERATED

Suggestion has been made that automobiles will take care of individual wants and that common-carrier auto-bus lines may be substituted for the city street-car lines. If it ever becomes necessary seriously to consider the adoption of such a substitute service, it should be based upon a coordinated plan of operation under the ownership of the Traction Company, in order that the aforesaid transfer schedule services between the more important Reno districts and Sparks may be harmoniously and profitably maintained at the minimum cost to the public for the future. Otherwise, it will doubtless be found that an automobile bus-line service, operating independently and upon schedule heretofore and now maintained by the city car lines, will be more costly and it probably could not be started or long continued upon a 10-cent fare and there would be no free transfer privileges as at present. Under the Commission's ruling in the Albert Pearl Case, decided July 28, 1919, P. U. R. 1919-F. 299, it is made clear that an established railway may supplement its service by the ownership and operation of automobile busses and trucks under section 36½ of the Public Service Commission Law, as amended in 1919.

In connection with auto-bus line service, it would seem to appear from the testimony put in evidence before the Federal Electric Railway Commission since its creation by the President during the past summer, and now about ready to render findings and recommendations upon street-railway problems and remedies, that the automobile bus costs more for fuel, repairs and depreciation per unit of traffic and therefore, generally speaking, is more expensive than up-to-date street-car transportation. However, this cannot be said to be true of the electric companies that have allowed their plant and equipment to become obsolete and therefore expensive in operation. On the contrary, in order to accomplish the aforesaid result, it has been found necessary to resort to a comparatively radical, although wise, departure from the present heavy cars to a very much lighter and more efficient standard of street car, that can be run during off-peak hours at a fraction of the cost per passenger because of the elimination of wasteful

dead weight in equipment. Further in this behalf, it has been shown that cars must be light and attractive, equipped with high-speed motors, and increased braking power provided; also provisions for light-weight trailers during rush hours. By the adoption of these methods it has been found that an appeal may be made to the public from both a service and a pleasure-riding standpoint which is not now possible, and that street-car service can be rejuvenated and made profitable.

DIFFICULTIES OF THE TRACTION COMPANY AND FAILURE OF THE CITIES TO COOPERATE

Some of the factors which have prevented the company from making needed replacements and betterments by which its service could have been maintained at a more economical and modern standard have been due to (a) its failure to reach an agreement with the City of Reno by which certain earnings could be transferred from street-paving requirements and placed into new equipment; (b) after unsuccessful effort to accomplish this result the company failed to file increased rates to cover its reasonable necessities in the matter of keeping its service up to standard; (c) from its inception, the company and the cities interested have never made adequate provision for depreciation reserve, out of which necessary replacements should have been made from time to time; (d) this policy of deferred maintenance and replacements has prevented the accomplishment of operating economies which would have otherwise been possible, and has caused a substantial portion of its equipment to become obsolete, costly in operation and unattractive to the public; (e) and because this practice of ordinary operating maintenance has erroneously been relied upon to continue the rendering of a satisfactory service in the face of rapidly mounting costs and improvements in the art of urban and city transportation which have taken place during the past five years.

It should be noted in passing that the experience of the Reno Traction Company and the cities of Reno and Sparks in this behalf is no different than that which has been found and is now being remedied in hundreds of other cities. Manifestly, it must be recognized at the start that repairs alone will not make antiquated equipment attractive, efficient and economical, and further, judged by changing and improved standards, it does not prevent obsolescence and excessive cost of operation from taking place in plant and equipment. The cars in use by the company are much heavier than necessary, from which it follows that they are costly in operation and maintenance and unnecessarily severe in wear and tear on track and paving. Most of these cars are obsolete and have served their fair life of modern usefulness and should either be junked or used for work or freight-train service in the future. Their out-of-date, dingy, dilapidated appearance is such as to discourage patronage if any other means of transportation is available, and this has had its effect in developing the walking habit and the purchase of automobiles, privately and cooperatively owned, to offset a service considerably below a fair and reasonable standard.

THE MODERN "ONE-MAN SAFETY CAR"

In lieu of the aforesaid equipment, one-man "safety cars" with high-speed motors, equipped for rapid acceleration and with increased

braking power for quick starting and stopping, should be substituted. The safety car is much lighter, faster and more accessible and inviting to the public. It is designed largely for the purpose of meeting automobile-bus competition and seats about 28 people, but crowded has carried as high as 50. It is operated by one man and has a number of safety features which gives it its name, important among which is a device by which, if the hand of the operator is taken off the control, it immediately flies to the "off" position, the rail is sanded, the air brakes applied automatically and the car brought to a stop. The door and steps are operated by compressed air and fold up along the side of the car when same is in motion. The car has high-powered braking capacity for quick stopping and very rapid acceleration which makes it possible to get under full headway very quickly after stopping. It has 25-hp. motors and all bearings are ball or roller. The car complete, all ready to operate, weighs about 15,000 pounds, whereas the present type of car weighs from 26,000 to 30,000 pounds. The ordinary cars, on the level, use approximately 2.5 K.W.H. in electrical energy per car-mile, while the safety car takes only about a third of this, or actually 0.8 K.W.H. per car-mile. The reduction in current consumption is much greater than the reduction in weight due to the use of ball or roller bearings and especially efficient motors. A large number of these cars have been installed during the past two years. They are being operated successfully and with substantial economy in Santa Rosa, Sacramento, San Diego, and many other cities throughout the United States.

The price of a safety car laid down in Reno is estimated to be about \$6,500, and in this connection it is also said that the General Electric Company will sell them on the basis of one-fourth payment down at time of purchase and thereafter accept installments until the cars are fully paid for. Obviously, these terms are reasonable and not arduous or burdensome. As the adoption of such a standard will result in the payment of the cars within a few years from the economies they will effectuate, as well as rendering an attractive and expedited service, which will promote car riding in place of walking or using other means of transportation, the company should, in my view, be required by the Public Service Commission to begin to make such changes in its equipment forthwith, while at the same time the Commission should provide for such increased fares as will fairly meet the increased cost of wages, materials and supplies which the company is now incurring and will for the future be required to meet. Further in this same connection, the City of Reno should forthwith relieve the company from street-paving costs and gross-earnings franchise taxes, which, from a service standpoint, are not warranted and have become an unreasonable burden under present conditions. The modernization and continuance of street-car service is of the highest value to Reno and Sparks, so much so in fact, that the aforesaid franchise payments should be relinquished with the understanding that they may be used for the future in providing up-to-date plant facilities and equipment.

ACTION TAKEN IN OTHER CITIES

In order to meet present high-cost conditions, and during the time which will be necessary to substitute lighter and more economical equip-

ment, the governmental authorities in many States and cities throughout the country have found it necessary to authorize an increase in street-car fares. Certain representative examples are set forth below:

At Harrisburg, Pa., the street-car fares were on August 1, 1918, increased from 5 to 7 cents a ride.

At Pittsburg, Pa., the street-car fares were, effective July 15, 1919, increased by the Pennsylvania Public Service Commission from a 5- and 7-cent zone basis of fares to a 10-cent cash fare for a single ride, or two tickets for 15 cents.

At Denver, the Public Utilities Commission and the city, by ordinance, during the early part of this year granted a 6-cent fare, and after further hearing and investigation and valuation of the property by the commission it was found that a 7-cent fare was justifiable; upon appeal to the courts, it was found that the commission was without jurisdiction and an effort was then made to have the city ordinance permitting the 6-cent fare rescinded. Ex-President Taft, after being called into consultation, urged the city to retain the present 6-cent fare, stating that the company could not operate for less and avoid bankruptcy. Oakland, Portland, and Seattle, where the volume of traffic is heavy, have this year raised street-car fares from 5 to 6 cents.

At Kansas City, effective August 20, 1919, the Public Service Commission of Missouri found it necessary to increase fares from 6 to 8 cents for a single ride or two tickets for 15 cents.

At St. Louis, Mo., effective September 10, 1919, the Missouri Public Service Commission, after full investigation, ordered the fares increased to 10 cents for a single ride or two rides for 15 cents, and the sale of 50-ride books for \$3.50 or at the rate of 7 cents a ride.

At Oshkosh, Wis., effective August 10, 1919, the Wisconsin Railroad Commission found it necessary to increase fares from 5 to 7 cents with graduated reductions in said rates for quantity rides or commutation-book service. In this case, reported in P. U. R. 1919-F. 640, the Eastern Wisconsin Electric Company made application for an increase in rates for service within the City of Oshkosh from 5 to 6 cents. This company operates street-car service within the cities of Oshkosh and Fond du Lac, and an interurban line service between said cities and other near-by interurban points, including Neenah-Menasha. During the year 1918 the gross earnings for the system as a whole were \$170,000, but operating expenses and taxes exceeded this amount by \$6,200. Within the City of Oshkosh the gross earnings were \$101,450, but the deficit resulting from an excess of operating expenses and taxes amounted to \$4,976. In this behalf it was shown that the average cost of operation, after considering increased cost of labor, material and supplies, was 16.68 cents per car-mile, compared with which the cost of similar street-car operations at Madison, Wis., was 17.6 cents per car-mile, while at La Crosse, Wis., the cost was approximately 14.5 cents per car-mile. (Incidentally the car-mile cost of operation of the Reno Traction Company averages 22.86 cents for the past five years.) After various tests and inventories the commission was satisfied that the Oshkosh operating costs and a property valuation amounting to \$683,000, based upon the heavy standard of operating plant and equipment in use, were not excessive and that therefore, under existing conditions, the fares were too low. The City of Oshkosh, represented

by its mayor, councilmen and attorney, intervened as parties of record and showed that the service was unsatisfactory to the public; that the cars in use were antiquated and had gone beyond the point of further repair and usefulness; that under such conditions of service an increase in fares was not warranted and that the service rendered was worth no more than the 5-cent fares which the people were required to pay. However, they made it clear that the people of Oshkosh were willing to pay an increased fare if provision was made whereby the company would purchase and operate new and up-to-date equipment. To this view the commission subscribed and urged the company and the city to cooperate in working out a plan that would provide for modern city service and compensatory rates. The company at once made arrangements and, on August 10, 1919, had secured and put into operation within the City of Oshkosh fifteen new one-man safety cars, at a cost of \$90,000, which has to a large extent remedied the bad service theretofore complained of and has opened the way by which the city and the traction company will ultimately bring the service up to a very satisfactory standard. After a full understanding of the situation, the city, in order to enable the company to purchase and properly carry out its investment in this new equipment, passed an ordinance releasing the company from the burden of all future street-paving obligations. Further, recognizing that increased revenues were necessary for an adequate and continued high-grade service to its people, the city petitioned the railroad commission to increase the cash fare from 5 to 10 cents a ride, including graduated rates to take care of quantity transportation and commutation-book service. But, in lieu thereof, the commission has, as aforesaid, effective August 10, 1919, tentatively ordered into effect a 7-cent cash fare, including graduated rates to take care of quantity transportation and commutation service, with the specific provision that the order was tentative and subject to change if satisfactory earning results fail to accrue from said rates after a fair trial.

This résumé of the Oshkosh situation and its treatment is representative of the action taken in many other cases in various cities throughout the United States during the past two years. In my view it affords an example which can be successfully and very beneficially followed in the Reno Traction case here under consideration.

SUGGESTED RATES, INCLUDING FREE TRANSFER PRIVILEGES, FOR RENO-SPARKS INTERURBAN SERVICE

It is urged that the Reno-Sparks line has been profitable during the past five years and will so continue for the future, but, based on present conditions and costs, this is doubtful, and in my judgment it will be found especially so when proper consideration is given to renewals, additions and betterments to track and equipment which are necessary at once, and the maintenance of which has been deferred during past years. In addition to these improvements, adequate cars and accommodations must for the future be provided for the rush morning and evening hours, while the semihourly schedule between Reno and Sparks must be continued until midnight in order to satisfactorily meet the service requirements of the people of Sparks. In consideration of the purchase and operation of new equipment, the increased

cost of wages, materials and supplies and the aforesaid improvements of schedules, I am of the opinion that, while the present 10-cent cash fare should be allowed to stand between Reno and Sparks, there has been too violent a reduction from said basis in the sale of monthly commutation books. Instead of their sale on a basis of a 5-cent fare as now provided, I feel, in view of the aforesaid costs which must be met, that a 7½-cent-fare basis would be just and reasonable for said monthly commutation-book service. In consideration of the high cost of every other necessity today, this would afford only a reasonable and necessary compensation for the purpose of building up and maintaining this essential transportation service at a high state of efficiency for the future.

**SUGGESTED RATES, INCLUDING FREE TRANSFER PRIVILEGES, FOR
THE RENO STREET-CAR SERVICE**

The cash fares within the City of Reno for the future should, for the reasons hereinbefore given, be increased from 5 to 10 cents for single rides or two tickets for 15 cents, to be sold by the conductor; further, that books limited to thirty days from date of purchase, and interchangeable among members of a family, be sold as follows: 15-ride books for \$1; 30-ride books for \$1.80; 62-ride books for \$3; 125-ride books for \$5. Further, that the fares for children between the ages of 8 and 12 years be charged for on a basis of one-half the above rates for both the city street-car and the Reno-Sparks services.

CONCLUSION

It may be urged that an increase in fares will cause a loss in patronage and therefore a loss in earnings, but experience in other cities, however, shows that, while in some cases there have been such losses immediately after the granting of the increased fares, yet, as a rule, the patronage has returned and the earnings increased. When the people have become fully informed of the necessities in such cases, they have been equally as anxious about working out a proper solution of their city's transportation problem as the transportation company and the regulating authorities have been. I believe that it may fairly be said that the people of Sparks and Reno will be found ready and willing to cooperate in working out a proper solution of their transportation problem along reasonable and effective lines, and, in this behalf, I am sure that the Commission will be glad to render every assistance possible in making effective such mutual plans as will afford a feasible remedy for the future.

In my judgment the public necessity and convenience is the paramount consideration in such cases as the one here under treatment. While adequacy of patronage and earnings are important considerations and may ultimately control in proving—after the public is fully informed and necessary improvements and economies have been brought about—that the aforesaid necessity is not of sufficient importance to warrant further service at an unreasonable loss, yet merely because it may be shown that certain portions of a system are unprofitable does not warrant its abandonment if it can be shown that the system as a whole is profitable or that action has been or can be taken to

make it profitable to the owners. One of the most important functions of the Commission is, after investigation, to order and enforce, by proceedings in mandamus through the Attorney-General's department when necessary, compliance with obligations arising from charter or franchise grants as to all matters relating to rates and services to be established and carried on by public-service corporations. In addition to this power, additional remedies are placed within the jurisdiction of the Commission under which various other effective regulations can be made for the protection and welfare of the public.

One of the duties of a railroad company doing business as a common carrier is that of providing reasonable and adequate facilities for serving the public at just and reasonable rates. This duty arises out of the acceptance and enjoyment of powers, privileges and property rights granted by the State and endures so long as they are retained. It represents a part of what the company undertakes to do in return for them, and its performance cannot be avoided simply because it will be attended by some pecuniary loss. See *U. P. R. R. v. Hall*, 91 U. S. 344; *New Orleans R. R. Co. v. Mississippi*, 112 U. S. 12; *St. Louis and San Francisco R. R. v. Gill*, 156 U. S. 649; *Munn v. Illinois*, 94 U. S. 113; *Baltimore Gas Case*, 130 U. S. 410; *Thomas v. Railroad Company*, 101 U. S. 71; *L. S. & M. S. R. R. v. Ohio*, 173 U. S. 285; *Atlantic Coast Line R. R. v. North Carolina Commission*, 206 U. S. 1; *Missouri Pacific Railroad v. Kansas*, 216 U. S. 262; *Oregon Railroad and Navigation Co. v. Fairchild*, 224 U. S.; *Chesapeake & Ohio R. R. v. Public Service Commission of West Virginia*, 242 U. S. 603; *Minnesota Rate Cases*, 230 U. S. 352; *Puget Sound Traction Case*, 224 U. S. 579.

In the *Gill Case*, *supra* (156 U. S. 649), the railroad insisted and was able to prove before the court that a maximum 3-cent fare law, adopted by the Legislature of Arkansas, was actually less than the cost of transporting passenger over certain lines of its system. In disposing of this question, the United States Supreme Court said:

It therefore appears that the allegations made and the evidence offered did not cover the company's railroad as an entirety even in the State of Arkansas, but were made in reference to that portion of the road originally belonging to the St. Louis, Arkansas and Texas Railway, and extending from the northern boundary of Arkansas to Fayetteville in said State. In this state of facts * * * it could not claim the right to earn a net profit from every mile, section, or other part into which the road might be divided, nor attack as unjust a regulation which fixed a rate at which some such part would be unremunerative; that it would be practically impossible to ascertain in what proportion the several parts should share with the others in the expense and receipts in which they participated; and, finally, that to the extent that the question of injustice is to be determined by the effects of the Act upon the earnings of the company, the earnings of the entire line must be estimated as against all its legitimate expenses under the operation of the Act within the limits of the State of Arkansas.

To the same effect, see *Puget Sound Traction Case* (Seattle), 244

U. S. 579, wherein the same issues were raised by an order of the Washington Public Service Commission fixing rates. The court's decision follows the reasoning laid down in the Gill Case, *supra*.

See, also, the North Carolina case (206 U. S.) wherein Chief Justice White distinguished between a rate-fixing case and a service case, by requiring the railway company to perform its duty to the public, even though the train service was performed at a loss.

ORDER

At a general session of the Public Service Commission of Nevada held at its offices in Carson City, Nevada, December 6, 1919:

The Commission having had formally under consideration questions involving Cases Nos. 496, 497 and 533, entitled "City Council of Reno v. Reno Traction Company," "City of Sparks v. Reno Traction Company," and "Petition of Reno Traction Company," respectively, relating to the safety and adequacy of the street-car service rendered by the Reno Traction Company within the City of Reno and between the cities of Reno and Sparks, Nevada, together with the question of allowing the Reno Traction Company to discontinue street-car service on certain lines now in the City of Reno, Nevada, *pursuant to the conclusions reached in the foregoing majority opinion, it is hereby*

ORDERED: That the Reno Traction Company be authorized to permanently discontinue service upon and over its street-railway lines in the City of Reno, Nevada, described in paragraphs numbered 1, 2, 3, and 4, below, effective January 15, 1920:

1. Commencing at the intersection of Second and Sierra Streets in said City of Reno, and running thence westerly on Second Street to the westerly limits of the City of Reno.

2. Commencing at the intersection of Fourth and Sierra Streets, running thence northerly on Sierra Street to Ninth Street; thence easterly on Ninth Street to Center Street (the present terminal of said line) at the main entrance gate of the State University grounds.

3. Commencing at the intersection of Second and Virginia streets, running thence southerly on Virginia Street to Moran Street, thence easterly on Moran Street to Wells Avenue; thence southerly on Wells Avenue to Cheney Street (the present terminal of said line).

4. Commencing at the intersection of South Virginia Street and California Avenue, and running thence westerly to Plumas Street; thence southerly on Plumas Street to Reno Avenue.

IT IS FURTHER ORDERED: That the Reno Traction Company be required to exercise the utmost diligence in repairing or renewing poles, wires, tracks, road-bed, rolling stock and other equipment used by it in and between the City of Reno and the City of Sparks, Nevada, to conform to standard street-railway practice for lines of this character.

IT IS FURTHER ORDERED AND DIRECTED: That the Reno Traction Company shall maintain for the future such property and equipment

as described in the foregoing paragraph in a safe and efficient condition.

It Is **FURTHER ORDERED**: That if any question arises as to the meaning of the terms "standard street-railway practice," or "a safe and efficient condition," the Commission will exercise the right to rule on the specific points at issue.

It Is **FURTHER ORDERED**: That the Commission reserves its jurisdiction in Cases Nos. 496 and 497 for the purpose of making such further orders as may be necessary to effectuate the aforementioned improvements on the system of the Reno Traction Company.

W. H. SIMMONS,
Commissioner.
J. G. SCRUGHAM,
Commissioner.

Attest: E. H. WALKER, *Secretary.*

Dated December 22, 1919.



CARSON CITY, NEVADA

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1920

BULLETIN

OF THE

NEVADA STATE BOARD OF HEALTH

Compiled and Edited by GUSTAV F. RUEDIGER, M.D., Reno

No. 1

CARSON CITY, NEVADA

January, 1920

THE BULLETIN

We present herewith the first issue of the popular Bulletin of the Nevada State Board of Health. To some of our readers it may not be entirely clear that there is a field for such a publication, and hence a brief discussion of its aims and purposes may not be out of place.

During the last four decades medical science has made marvelous advances. We have discovered the causative agent of a long list of infectious diseases, and have learned much about their modes of transmission and prevention. We know the specific germs which cause typhoid fever, cholera, dysentery, diphtheria, pneumonia, tuberculosis, whooping-cough, tonsillitis, mumps, erysipelas, plague, malaria, child-bed fever, lockjaw, meningitis, Malta fever, sleeping sickness, carbuncles, syphilis, gonorrhea, anthrax, glanders, etc., and much information is at hand in regard to the prevention of these diseases. We do not know as yet the germ of scarlet fever, measles, influenza, Rocky Mountain fever, yellow fever, rabies and several other diseases of an infectious nature, but we do know something about their manner of transmission from one person to another and their prevention.

Much of this knowledge is clothed in more or less technical language and buried, for the lay reader, in the archives of our libraries of science. It is the purpose of this Bulletin to popularize this knowledge and put it in possession of every citizen of Nevada who has the inclination to read. We shall aim to present this information in such a form that anybody who can and will read the English language may easily acquire it and profit therefrom. Such will be the mission of our Bulletin.

RABIES IN NEVADA

During the last five years there has been a great deal of rabies among the coyotes, dogs, and other animals in this State, and in consequence many head of cattle, hogs, and horses have been lost through this disease. Not infrequently human beings are being bitten by mad dogs or coyotes, or are exposed to infection by other animals that are suffering from the disease. The infection is transmitted to man almost entirely by means of a bite or scratch with the teeth of the infected animal, but occasionally a person may become infected when handling the diseased animal while fresh sores exist upon his hands. There are cases on record also where a man has been infected by a pet dog licking a sore on the man's face.

Many people seem to be of the opinion that they may become infected by coming in contact with a rabid animal, although they were not bitten and did not handle the animal in such a way that a scratch or other sore on their body might have become contaminated with the saliva from the animal's mouth. One person even asked the question whether or not he could become infected by eating the eggs from his hens which had been feeding in the barnyard where a horse had recently died of rabies. It should be made perfectly clear to everybody that the infection of this disease does not travel through the air and is not readily transmitted to a human being except by means of a bite from the rabid animal. Infection may also take place when a fresh sore on the person's body has become contaminated with the fresh saliva from the mouth of such an animal.

During the last four and one-half years 191 residents of this State have been given the Pasteur preventive treatment for this disease at the State Hygienic Laboratory. Some of these had been bitten either by a mad dog, coyote, or other animal, and others were otherwise intimately exposed to the infection by taking care of a sick animal that was later found to have rabies. Many others who had been exposed to the infection have come for advice, but were sent home without the treatment because the chances of having become infected seemed too remote.

In every case where a person has been infected by a rabid animal or has been intimately exposed to the infection, a number of questions arise in regard to the best method of procedure. When the bite has been inflicted by a dog, the first impulse generally is to kill the dog. This is not the best course to pursue if the dog can be captured and chained or corralled for further observation. If the animal does not appear to be sick at the time, and shows no sign of sickness within a week or ten days, we may conclude positively that it does not have

rabies. On the other hand, if the animal is immediately killed, it may be impossible for us to determine whether or not it had the disease. In a well-established case of rabies, the microscopic examination of the brain matter usually reveals the presence of the so-called Negri bodies which are considered positive evidence of this disease. During the earliest stages of the disease, however, it may be very difficult or impossible to find these bodies, and we then have no means to determine whether or not the person who has been bitten should be given the Pasteur treatment. We have no means of determining by a microscopic or other examination of the bite whether or not the animal that inflicted it had rabies. It must be stated also that we have no blood-test that will decide whether or not the person who has been bitten is infected. In case of a dog-bite, therefore, the best procedure is to either chain the dog or shut him up in a barn or garage or some other safe place where he cannot get away, and keep him under observation. If he shows distinct signs of sickness, especially if he appears gloomy, or restless, cross, and irritable, and later appears to be weak in the hind-legs, he may be killed and the entire head sent to the State Veterinary Control Department, University of Nevada, for examination for evidence of rabies. In killing such a dog it is very important that he should not be shot through the head, which may shatter the brain and render it unsuitable for the microscopic examination. As a rule, the animal does not live longer than a week after the onset of the disease, and it may be best to let him die and then send the head for microscopic examination. This usually gives the infected person ample time to take the Pasteur treatment, because the symptoms rarely appear in less than three to six weeks after infection. In cases of severe bites on the face and head, however, treatment should not be delayed.

Do not send the head of an animal to be examined for rabies to the State Hygienic Laboratory, but to the State Veterinary Control Department, University of Nevada, Reno. In warm weather it is very important that the head be packed in ice during shipment, or else be wrapped in a large cloth that has been soaked in a solution of a volatile antiseptic. For this purpose a 10% solution of formalin in water is satisfactory. If formalin is not readily at hand, a strong solution of chloride of lime may be used instead. The cloth used for this purpose must be thoroughly saturated with the solution, and the head, when wrapped in it, must be packed in a tight box or sealed tin can and shipped by prepaid express. Do not immerse the head in the antiseptic solution, but merely wrap it in the wet cloth.

Symptoms of Rabies

In dogs two forms of this disease have been recognized—namely, furious rabies and dumb rabies. The two types are not essentially

different, but in dumb rabies the symptoms of paralysis appear very early, and the dog is quite helpless and more or less harmless. The first symptoms usually are a change in the animal's disposition. The animal usually becomes dull and gloomy and may hide in out-of-the-way places or under pieces of furniture in the house. In his retirement, however, he is restless, frequently changing his position or getting up and walking about. At this stage hallucinations may begin, and the animal is seen to bark and bite at imaginary objects. He usually avoids his master, but when called may become very affectionate and display a great desire to lick his master's hands. Food may be taken during this stage, if it can be swallowed without mastication, but later difficulty in swallowing will be noticed. Mad dogs are not afraid of water, as is commonly supposed.

In the second stage, or stage of excitement, the animal becomes more restless and frequently leaves home, wandering about in a more or less aimless fashion. He usually trots at a rapid pace and may not pay any attention to objects he passes. On the other hand, if he is startled by another animal or person, he usually attacks them with great fury, but, as a rule, he does not seem to be looking for trouble. At times he may appear to be quite gentle and friendly with people, but on the least provocation he will snap at them and bite. If kept confined in a cage or stable, he may throw himself violently against the bars or doors and bite at them so violently that the teeth may be broken. During this period the animal may swallow all kinds of foreign objects and tear up anything it gets hold of. Gradually the paralytic symptoms begin to appear and the paroxysms of fury subside. The muscles of the jaw usually are the first ones to become paralyzed, and then the dog may be unable to close his mouth. Very soon the muscles of the throat are involved and the animal is unable to swallow liquid or food of any kind, and at the same time the bark becomes hoarse and double and may be accompanied by loud and long-drawn howls. Later the muscles of the hind-legs and hind part of the body become weak and eventually are paralyzed so that the animal cannot stand upon its hind-legs. Paralysis now extends very rapidly, the animal becomes entirely helpless and dies from exhaustion. Death usually takes place within four or five days from the onset, but cases have been known to live as long as twelve days.

CATCHING COLD

An ordinary cold is a bacterial infection of the mucous membrane of the upper part of the respiratory tract. Usually the nose, pharynx or tonsils are involved, and more rarely the larynx or voice-box. In

the latter case, there is more or less hoarseness, or total inability to speak above a whisper.

The simple acute colds are frequently divided into two classes, *i. e.*, contagious and noncontagious.

Contagious colds generally occur in epidemics, and the exciting cause is the lodgment of the proper germs, with high disease-producing powers, upon the mucous membrane of a susceptible person. The source of these germs usually is the spray that is given off from an infected person's nose or mouth during the act of sneezing, coughing, or talking. The factor of prime importance is the lodgment of the germs upon the mucous membrane. These germs have such a high power of producing disease that their lodgment upon the mucous membrane results in an infection in the majority of cases.

There are many colds, however, that are not contagious and do not occur in epidemics. It is a well-established fact that disease germs of low disease-producing powers are frequently or almost constantly found on the mucous membrane of the nose and throat of every person. Under circumstances favorable to the well-being of the individual, these germs appear to do no harm, but let his body get thoroughly chilled over a considerable period of time and there is set up an infection which we commonly call a cold. Here the factor of prime importance was not the lodgment of the germs on the mucous membrane, but the chilling of the body by a cold draft, by getting wet, or by not having on sufficient clothing or not enough bed-clothing. Many colds are undoubtedly "caught" from not having enough bed-clothing when sleeping in a cold room.

It may be well to mention in passing that there is no particular virtue in extremely cold air in the sleeping-room. If one chooses to sleep in a very cold room with windows open, or on a sleeping-porch in wintertime, it is important that proper bed-clothing and a sleeping-bag be provided to keep the body from being unduly chilled. No good can ever result from sleeping out-of-doors or in a cold room with windows open, if the person does not have sufficient and proper bed-clothing to keep the body comfortably warm. Under most circumstances it is better and far more comfortable to sleep in a moderately cool (temperature between 50° and 60°F.), but well-ventilated, room.

Many popular lecturers on hygiene have promulgated the doctrine of sleeping out-of-doors or in very cold rooms and have tried to popularize the teaching that a cold draft or any other chilling of the body practically never produces a cold unless the air we breathe is stagnant and polluted. Physicians as a group have never taken up this latter doctrine with enthusiasm, because they know from experience that many serious colds are produced by cold drafts, wet feet, or any other

undue and prolonged chilling of the body, and this in spite of the fact that the person happens to be out-of-doors at the time. We do not wish to minimize the importance of fresh air in sleeping-rooms, but rooms can usually be properly ventilated without being extremely cold.

There has been no small amount of speculation in regard to why chilling of the body should bring on an infection of the mucous membrane of the nose and throat. When the surface of the body is chilled, the small blood-vessels of the skin contract and there is produced in the skin a condition of anemia, or relative bloodlessness. Under these circumstances the blood is forced into the interior of the body, and pathologists concluded from this that the mucous membranes of the nose and throat would receive an oversupply of blood, or would be in a state of congestion. This was supposed to so alter the life-processes within the cells as to lessen their resistance to the invasion of disease germs, and thus the germs which were present on the mucous membrane in a dormant condition would get a foothold and set up an inflammation which we call a cold.

Recent careful experimental investigation of this question by Mudd and Grant of St. Louis has proven, however, that chilling of the surface of the body does not produce a congestion of the mucous membranes of the nose and throat, but just the opposite condition—namely, a local anemia or relative bloodlessness. In this condition of deficient blood supply, the surface temperature of the mucous membrane is lowered and under these conditions the cells appear to suffer in such a way as to render them less resistant to the invasion of the germs; or at any rate permit the infection to occur. It is not certain just what are the changes in the mucous membrane which permit the infection to get a start, but, whatever they may be, it appears that they are ushered in by a chilling of the surface of the body, which, by reflex action, produces a condition of relative anemia and lowering of temperature in the mucous membrane of the nose and throat. This surface chilling of the body, however, does not produce a lowering of the temperature of the blood within the body, but only of the skin and mucous membrane of the nose and throat, by reflex contraction of the small blood-vessels in these localities.

Many colds are caused by the same germs that produce pneumonia—namely, the pneumococcus and the streptococcus. It is important, therefore, that a severe cold should not be neglected, for fear that it may run into pneumonia. Many cases of pneumonia are known to follow a severe and prolonged chilling of the body, such as is caused by sleeping out-of-doors in the cold under forced circumstances, or by a thorough wetting of the clothing with ice water when no change of clothing can be had for some time.

A person with a cold should avoid getting the body chilled whether from cold drafts, wet stockings or other clothing, or any other exposure. If the cold is at all severe, it is best to remain in the house, or even in bed, with the air comfortably warm but well ventilated and not overheated nor stagnant. If the air is very dry, it may be rendered less irritating to the mucous membranes of the nose and throat by keeping a kettle of boiling water in the room. Hot drinks taken at bedtime to promote perspiration are often found helpful, but great care must be taken to avoid getting chilled. The bowels must be kept open, with mild laxatives if needed. The irritation in the nose and throat can often be eased by use of a hot gargle for the throat and a hot alkaline douche for the nose. For this purpose a solution made by dissolving half a teaspoonful of common salt and an equal amount of baking soda in a cupful of hot water is often found helpful. An atomizer or a glass nasal douche is a convenient aid in applying the solution to the mucous membrane of the nose. If the patient is running a fever and his condition is not readily improved by simple home remedies and a stay in the house, a physician should be called to take charge. Neglect of a cold often results in a long and serious illness.

AN INDIAN REMEDY FOR INFLUENZA

In publishing this paper the State Board of Health does not give its endorsement to the remedy until it has had further trial. We merely present the facts as stated by Dr. Krebs, with the idea of giving the matter publicity and encouraging others to give it a trial.

During the fall of 1918 when the influenza epidemic visited this section of Nevada, the Washoe Indian used a root in the treatment of their sick which was gathered along the foot-hills of this slope of the Sierra. The plant proved to be a rare species of the parsley family (*Leptotamia dissecta*), according to a report from the University of California.

The Indians gather this root in the late fall, November being considered the proper month for gathering. The root is used in the fresh or dry state. It is cut up and a decoction is made by boiling the root in water, skimming off the top and giving large doses of the broth. A pound of root is considered about the proper dose to treat a case of fever for three days, which is the longest time needed to break up a fever due to influenza or a pulmonary disease, although the Washoes use it as a panacea. Whether a coincidence or not, there was not a single death in the Washoe tribe from influenza or its complications, although Indians living in other parts of the State where the root did

not grow died in numbers. It was such a remarkable coincidence that the root was investigated by a practicing physician who saw apparently hopeless cases recover without any other medication or care of any kind. A preparation was prepared and employed in a great many cases among the whites, from the mildest to the most virulent types of influenza, and it proved, among other things, that it is the nearest approach we have today to a specific in epidemic influenza and the accompanying pneumonia. Where used early it proved itself to be a reliable agent in preventing pulmonary complications. Other physicians were induced to give it a trial, with the same results. It is beyond the experimental stage, as its therapeutic action in this direction is established and beyond any doubt. The cases in which it has been used run into the hundreds. There is probably no therapeutic agent so valuable in the treatment of influenzal pneumonia and, as far as being tried, in ordinary lobar pneumonia if started early. Its action on coughs is more certain than the opiate expectorants and its benefit is lasting. It acts as a powerful tonic to the respiratory mucous membranes. It is a bronchial, intestinal and urinary antiseptic and is excreted by these organs. It seems to stimulate the pnegastrics and causes a slow pulse with increased volume and reduced tension. It is a pronounced diaphoretic and somewhat diuretic, and it is a stimulating and sedative expectorant. In large doses it is a laxative, and in extreme doses emetic.

To make a therapeutically active preparation, the proper variety of the root must be selected in the late fall and properly cured out of the sun. Its active principles must be extracted with as little as possible of the objectionable constituents. The active principles of the root are decidedly complex. It contains a glucoside (as its solutions precipitate copper from Fehling's solution). It contains one or more alkaloids and an acid analogous to benzoic acid, one or more volatile and fixed oils, a resin, and a gum. It can be seen from this that it resembles a balsam from the fact that it contains an oleogumresin and an acid besides alkaloids and glucosides. One can at once appreciate the fact that a reliable pharmaceutical preparation representing the action of the root is not readily made. The volatile oil, which is one of the principal therapeutic agents, is lost in making a decoction.

This particular variety of *Leptotamia* is not as common as believed by some, and it is this particular variety that has medicinal or therapeutic virtues. It grows in dry sandy soil, as a rule, under or between tall sagebrush or greasewood. The plant grows from two to four feet high and has a blossom similar to wild parsnip and leaves like a carrot. It is a perennial, and the older roots frequently weigh from two to six pounds. It sprouts early in April, blooms in May, seeds in June, and

withers in July. A number of trials in transplanting the root have been made, but none were successful.

Leptotamia dissecta is destined to become one of the most useful if not the most important addition to our vegetable materia medica.

ERNST T. KREBS, M.D.,
Carson City, Nevada.

THE CONTROL OF VENEREAL DISEASES

During the recent world war, the United States Public Health Service has outlined a program for the suppression of, and inaugurated a nation-wide campaign against, venereal diseases. In this campaign they are seeking and must have the cooperation of every state and city board of health if notable results are to be achieved. Practically every state board of health in the United States, except that of Nevada, has indicated its willingness to cooperate, and has promulgated rules and regulations for the reporting and suppression of these diseases within its jurisdiction. The State Board of Health of Nevada has been unable to take part in this campaign because of a lack of clerical help and a lack of funds for the employment of such help. Moreover, the board has no epidemiologist or other field worker to organize such a campaign and enlist the cooperation of every physician, health officer and public health or charitable organization in the State, without which the campaign is sure to be a failure.

It is impossible to say how prevalent syphilis, gonorrhea and chancre are in this State, but we know from the returns of the draft boards that approximately 3% of the young men who came up for examination in this State were at the time suffering from a venereal disease. This percentage is not as high as in some of the Southern States, but is high enough to show that venereal diseases are more prevalent than any other infectious disease. If 1 out of every 33 young men in our community were afflicted with smallpox or tuberculosis, we would not long hesitate to provide funds for the control and suppression of these diseases. It may be true that the venereal diseases are not so likely to prove fatal as smallpox or tuberculosis, but it is equally true that syphilis and gonorrhea cause more sickness, misery and suffering, especially on the part of the innocent, than does any other contagious disease known to mankind. It is true also that those measures which have been successfully adopted in the control and suppression of smallpox, plague, scarlet fever, etc., will be equally successful in the control of syphilis, gonorrhea and chancre if vigorously applied.

In taking up this problem, the first thing necessary for success is the reporting of all known cases to the health department. It must be

the aim and purpose of the central health authority of the State "to reduce the prevalence of the venereal diseases as much and as rapidly as possible by the detection and treatment of all cases and carriers not otherwise under treatment and by preventing the exposure of other persons to these infectious cases. There must, therefore, be a thorough campaign of medical treatment, combined with the application of all measures that experience has shown to be helpful, such as education, law enforcement, reporting of cases, follow-up work, etc."

Many well-meaning citizens, who are thoroughly convinced that something should be done for the prevention and suppression of these diseases, have hesitated to carry their convictions into effect because of the erroneous belief that such a campaign necessarily gives publicity to all existing cases. This, however, is not the case, and it would be a foregone conclusion that the campaign would meet with defeat if the name of every person who is infected with one of these diseases were made public. Quite the contrary course is pursued wherever this problem has been attacked by the health authorities. The rules and regulations which are recommended by the United States Public Health Service, and which are usually adopted, requiring the reporting of these diseases, are as follows:

RULE 1. *Venereal Diseases To Be Reported.* Any physician or other person who makes a diagnosis in, or treats, a case of syphilis, gonorrhea, chancroid, and every superintendent or manager of a hospital, dispensary, or charitable or penal institution, in which there is a case of venereal disease, shall report such case immediately in writing to the local health officer, stating the name and address or the office number, age, sex, color, and occupation, of the diseased person, and the date of onset of the disease, and the probable source of the infection; *provided*, that the name and address of the diseased person need not be stated except as hereinafter specifically required. The report shall be inclosed in a sealed envelope and sent to the local health officer, who shall report weekly on the prescribed form to the State Board of Health, all cases reported to him.

RULE 2. *Patients To Be Given Information.* It shall be the duty of every physician and of every other person who examines or treats a person having syphilis, gonorrhea, or chancroid, to instruct him in measures for preventing the spread of such disease, and inform him of the necessity for treatment until cured, and to hand him a copy of the circular of information obtainable for this purpose from the State Board of Health.

RULE 3. *Investigation of Cases.* All city, county, and other local health officers shall use every available means to ascertain the existence of, and to investigate, all cases of syphilis, gonorrhea, and chancroid within their several territorial jurisdictions, and to ascertain the sources of such infections. Local health officers are hereby empowered and directed to make such examinations of persons reasonably suspected of having syphilis, gonorrhea, or chancroid, as may

be necessary for carrying out these regulations. Owing to the prevalence of such diseases among prostitutes and persons associated with them, all such persons are to be considered within the above class.

RULE 4. *Protection of Others from Infection by Venereally Diseased Persons.* Upon receipt of a report of a case of venereal disease it shall be the duty of the local health officer to institute measures for the protection of other persons from infection by such venereally diseased person.

a. Local health officers are authorized and directed to quarantine persons who have, or are reasonably suspected of having syphilis, gonorrhea, or chancroid whenever, in the opinion of said local health officer, or the State Board of Health, or its secretary, quarantine is necessary for the protection of the public health. In establishing quarantine the health officer shall designate and define the limits of the area in which the person known to have, or reasonably suspected of having, syphilis, gonorrhea, or chancroid, and his immediate attendant are to be quarantined, and no persons other than the attending physicians shall enter or leave the area of quarantine without the permission of the local health officer.

No one but the local health officer shall terminate said quarantine, and this shall not be done until the diseased person has become noninfectious, as determined by the local health officer or his authorized deputy through the clinical examination and all necessary laboratory tests, or until permission has been given him so to do by the State Board of Health or its secretary.

RULE 5. *Conditions under which the Name of a Patient Is Required To Be Reported.* a. When a person applies to a physician or other person for the diagnosis or treatment of syphilis, gonorrhea, or chancroid, it shall be the duty of the physician or person so consulted to inquire of and ascertain from the person seeking such diagnosis or treatment whether such person has theretofore consulted with or has been treated by any other physician or person and, if so, to ascertain the name and address of the physician or person last consulted. It shall be the duty of the applicant for diagnosis or treatment to furnish this information, and a refusal to do so or a falsification of the name and address of such physician or person consulted by such applicant shall be deemed a violation of these regulations. It shall be the duty of the physician, or other person whom the applicant consults, to notify the physician or other person last consulted of the change of advisers. Should the physician or person previously consulted fail to receive such notice within ten days after the last date upon which the patient was instructed by him to appear, it shall be the duty of such physician or person to report to the local health officer the name and address of such venereally diseased person.

b. If an attending physician or other person knows or has good reason to suspect that a person having syphilis, gonorrhea, or chancroid is so conducting himself or herself as to expose other persons to infection, or is about so to conduct himself or herself, he shall notify the local health officer of the name and address of the diseased person and the essential facts in the case.

The Nevada State Board of Health is willing to undertake the suppression of these diseases just as soon as the necessary funds therefor are available. In order to make a success of such a campaign it will, however, be necessary to have not only the necessary funds, but also the hearty cooperation of every physician and the moral support of every influential citizen of the State. We already have a law making it a misdemeanor for any person who is afflicted with a contagious venereal disease to have sexual intercourse with another person. The law requires that every physician who knows "that any common prostitute is afflicted with any infectious or contagious venereal disease" shall "immediately notify the police authorities of the town, city, or place where such prostitute is at the time of the discovery of the existence of such disease."

This law is good as far as it goes, but it would be more workable if it required all venereal diseases to be reported to the health officer and not to the police authorities. Moreover, there is no provision for placing under quarantine any common prostitute who is known to be afflicted with such a disease, and without quarantine it is wholly impossible to keep them from spreading their infection to others.



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Official Laboratory for the State Board of Health

STATE HYGIENIC LABORATORY,
UNIVERSITY OF NEVADA, RENO.

GUSTAV F. RUEDIGER, M.D., Ph.D., *Director.*



CARSON CITY, NEVADA

STATE PRINTING OFFICE : : JOE FARNSWORTH, SUPERINTENDENT

1920

BEFORE THE PUBLIC SERVICE COMMISSION OF NEVADA

C. P. C. APPLICATION No. 28

In the Matter of the Application of **GINOCCHIO BROTHERS** for
a Certificate of Public Convenience and Necessity to Operate as
an Auto-Freight-Truck Common Carrier Between Reno and
Gardnerville and Intermediate Points.

APPEARANCES:

For the Commission:

Chairman J. F. SHAUGHNESSY,
Commissioner W. H. SIMMONS,
Commissioner J. G. SCRUGHAM,
Secretary E. H. WALKER.

For Ginocchio Brothers, Applicant:

L. J. GINOCCHIO, Owner,
JAMES GINOCCHIO, Owner,
GEO. A. MONTROSE, Attorney,
E. CHRISTENSEN, for Gardnerville Shippers.
E. C. HOWARD, for Gardnerville Shippers.

For Virginia and Truckee Railway, Protestant:

A. M. ARDERY, Vice-President and General Manager,
F. E. MURPHY, Attorney,
GEORGE L. SANFORD, Attorney,
HOWARD L. GRIFFITHS, Traffic Manager.

OPINION

SHAUGHNESSY, *Chairman:*

The issues in this proceeding arise upon application of Ginocchio Brothers, hereinafter termed applicant, for a certificate of public convenience and necessity to operate an auto-truck freight service between Reno and Gardnerville and intermediate points, at fixed rates for service between said points, which are on file with this Commission. The truck line has been in operation for several years and, following the passage of an amendment or reenactment of the Public Service Commission Act (section 36½) by the Legislature of 1919, all owners of public utilities were notified to make application for a certificate of public convenience for authority to continue the rendering or the extension or improvement of service, as provided for in the aforesaid section. Conformable to this amendment, therefore, Ginocchio Brothers filed their application and hearing upon the same was had before the Commission on July 28, 1919, at which time the Virginia and Truckee Railway Company, hereinafter termed protestant, represented by its

vice-president and attorney, appeared in protest against the granting of said application and asked for further hearing and opportunity to submit formal pleadings and further testimony in the proceeding. This request was granted and thereafter said formal protest and additional testimony was, on October 11, heard before the Commission at a public hearing at Carson City, Nevada, wherein applicant was afforded full opportunity to cross-examine protestant's witnesses and to offer additional testimony, which was done.

PLEADINGS AND TESTIMONY OF PROTESTANT

Protestant made the following allegations:

That it is a steam-railway common carrier operating daily freight and passenger trains in each direction between Reno and Virginia City, a distance of 52 miles, and that it operates a daily mixed-train service between Carson City and Minden, a distance of 15 miles, and that its passenger service during the spring, summer and fall months is augmented by the operation of a high-grade motor-car service daily in each direction between Gardnerville, Carson City, and Reno, and that for the future it will continue a train service that will promptly and properly meet all the requirements of the shipping public contiguous to its lines and notably to and from Carson City, Minden, and Gardnerville; that it is not unmindful of the important part that automobile transportation is taking in the commercial activities of the day, of the study, wisdom and foresight that must govern the new responsibilities upon the Commission, in order that the public may be fairly protected and that no injustice may be done to establish carriers; that the benefits to be derived by the people should be fairly subserved, while at the same time seeing that care is exercised in the inauguration of new systems of transportation in order to prevent unwarranted abuses. That, in this behalf, the public should be safeguarded by the requirements of indemnity bonds from auto transportation companies as a guaranty against loss by injury to persons, loss and damage to baggage and freight, and the surety of carrying out the orders of the Commission as provided in section 18, requiring that bonds shall be filed by automobile transportation companies in amounts ranging from a minimum of \$500 to a maximum of \$10,000. That the establishment of central freight and passenger depots, as required by section 22 of the Public Service Commission Act of all railroads, should be exacted of the auto-truck lines as an essential part of the transportation service rendered by them; that the filing of complete tariff schedules, both to terminal and intermediate points, should be strictly enforced and required of auto transportation agencies in the same manner as such regulations are enforced against railway common carriers. Further, that the Public Service Commission was created not only to protect the interests of the shipping and traveling public by the establishment of proper and reasonable rates and provisions for adequate service, but it was likewise within the province of the Commission and obligatory upon it so far as within the scope of its jurisdiction to protect invested capital in public-service industries, in order that sufficient revenue may be insured to guarantee the service which may be expected from such enterprises and the payment of a reasonable return upon the investment.

RAILWAY VALUATION AND EARNINGS

Protestant further alleges that the total assessed valuation of its railway system for the year 1919 was approximately \$900,000; that the company paid in taxes \$9,448 in Ormsby County, \$2,399 in Douglas County, \$5,240 in Washoe County, \$2,061 in Lyon County, and \$4,422 in Storey County; that the total net income from all freight and passenger traffic of every kind and nature of said railroad was diminishing because of high cost of labor, material, and supplies, and in this behalf would amount to the sum of only \$8,845 for the year ending June 30, 1919; that no depreciation was charged against the gross earnings in arriving at the net, and that if the same had been charged as allowed by law, there would be a deficit; that the scrap or residual value of the railroad was from \$400,000 to \$450,000, and that if the owners of the property saw fit to junk the railroad they could derive an approximate income of from \$24,000 to \$27,000 annually by an investment in ordinary available securities, an amount exceeding the sum representing net income under present operations; that a segregation of the earnings and operating expenses covering railway freight business between Reno and Minden was made and placed in evidence by protestant, showing that for the year ending December 31, 1918, the gross earnings were \$53,648, whereas operating expenses were estimated at \$50,586 and taxes at \$4,132, or total expenses amounting to \$54,718, from which it was made to appear that there was an estimated loss in freight service amounting to \$1,070. In this connection, however, it was shown that the net earnings of the protestant's railway system as a whole, reported and on file with the Public Service Commission, for the five-year period, 1915 to 1919, inclusive, amounted to \$145,411, or an average net income of \$29,082 per annum.

TRUCK LINE DIMINISHES RAILWAY INCOME, ALREADY INADEQUATE TO PAY FAIR RETURN ON INVESTMENT

Protestant further alleges that said freight-truck line has defeated any right it might have obtained to continue service as an established carrier by a departure from its tariffs on file with the Commission, by the acceptance of a subsidy of one dollar per ton in addition to its published rates which it is alleged is paid as a bonus for a constructive haul of freight from Minden to Gardnerville. Further, because it failed to file its rates, bond and reports with the Commission to cover its operation for the years 1917 and 1918, or not until its application for a certificate of public convenience was made under the law as amended in 1919; that it is impractical and impossible for a truck line to alone adequately transport all freight handled by the railway during the summer season, and during part of the winter season impossible to transport any freight whatsoever; that the railroad has, in the past, and does now, give an all-year daily service, and that the railroad is an absolute necessity for the progress and development of the country served; that the railroad is not making an adequate return upon its investment; that the operation of the truck line depreciates the income of the railroad because the freight and the income of the truck company would ordinarily accrue to the railroad; that the territory served is limited and the installation of another carrier would further depreciate the revenues of the railway and eventually result in inferior service,

greater freight charges and higher passenger rates, if an adequate return is to be realized upon protestant's railway; that no necessity has been shown or established requiring the operation of the proposed truck line and that it has not been shown that the convenience of the public will be met by the operation of such a truck line, in consideration of which protestant alleges that neither public convenience nor necessity is to be subserved by the continuation or establishment of a competitive auto-truck service to and from the stations mentioned. While not reaching or serving the town of Gardnerville directly, protestant alleges that it is within reasonable delivery distance from Minden Station, its terminal, which is located one mile from the town of Gardnerville, and that therefore the latter point should not be considered as competitive territory entitled to additional privileges or services to that rendered by the railroad; that if the service rendered by the Virginia and Truckee Railway Company is not adequate for the territory served, complaint should be made, hearing held, and thereafter an order made by the Commission by which the public will be granted such service as is contemplated and required by the law.

APPLICANT'S ANSWER AND SUPPORTING TESTIMONY

Ginocchio Brothers, the applicant in this proceeding, represented by counsel, and accompanied by witnesses from Gardnerville, filed answer and appeared at the aforesaid hearing in support of said application for a certificate of public convenience and necessity to continue the operation of an auto freight-truck line between Gardnerville and Reno. By answer, testimony and documentary evidence, applicant made the following showing:

That it operates an auto freight-truck line and renders service between Reno and Gardnerville and intermediate towns, cities and ranches, as well as rendering service in the city of Reno; that it began operating said auto line with two three-ton trucks in April, 1916, and so continued until June, 1919, when a third three-ton truck was placed in service; that the road mileage over which said operations are conducted between Reno and Gardnerville is 51 miles and the running time is three hours and twenty minutes; that the truck line not only transports, but also picks up and delivers traffic at residences, farm-houses, warehouses, and stores; that it operates a triweekly service and renders extra service as business justifies, unless prevented by impassable road conditions during infrequent heavy storms; that all classes of traffic offered are handled without discrimination to the public desiring service between Reno and Gardnerville at the rate of 40 cents per hundred pounds or \$8 per ton, except on bulky freight such as wool, furniture, etc., which is charged for on a space or service basis; that in the handling of various classes of traffic between said points sheep and hogs have been freely transported, and, while thus far no cattle shipments have been made over this line, it is asserted that by equipping the trucks with proper racks this class of live stock can be handled; that the daily gross earnings average \$60 per day on said line including Reno business to and from ranches along the route, and that, after paying expenses and upkeep, the net earnings average approximately \$20 per day. Further, that the business men of the town of Gardnerville invited and requested the said Ginocchio Brothers to enter into the business of hauling and transporting freight between

the city of Reno and the town of Gardnerville; that since the first trip of the trucks they have been constantly supplied with freight by the merchants of Gardnerville and at the present time are constantly hauling such freight; that freight is now landed at the doors of the Gardnerville merchants with promptness and safety and at a saving to them over the rates charged when shipments are made over the Virginia and Truckee Railway, as cartage and storage are eliminated; that said auto-truck line has heretofore been and is now giving satisfaction to the general public as a common carrier, and that in support thereof the people of Gardnerville have filed with the Public Service Commission a petition requesting that a certificate of public convenience be granted to said Ginocchio Brothers to operate an auto freight-truck line between Reno and Gardnerville.

VIRGINIA AND TRUCKEE RAILWAY FAILS TO EXTEND SERVICE TO GARDNERVILLE

Applicant further alleges that the said Virginia and Truckee Railway has failed to adequately meet the transportation requirements of the public at Gardnerville and points beyond, and that this failure works against the best interests of the people of Gardnerville and adjacent territory; that the Virginia and Truckee Railway maintains and has maintained a terminal station at Minden, a mile or more from the town of Gardnerville; that against the protest of the general public, said terminal was established at its present location at a time when the said town of Minden was a town site without a town; that this action is prejudicial and opposed to the welfare and best interests of the town of Gardnerville and its citizens; that the said Virginia and Truckee Railway has been solicited at various times to extend its line to the town of Gardnerville, in consideration of which offers have been made to supply free of charge depot and warehouse sites and in many other ways to assist the said railway in becoming a public carrier for the convenience and service of the town of Gardnerville, but, in this behalf, the said railway has refused and does now refuse to consider the matter and has ignored the requests and offers made; that in retaining the town of Minden as the terminal point of said railway in Carson Valley and refusing to extend service to the town of Gardnerville and adjacent points, the merchants and business men of Gardnerville are discriminated against by said railway company in the delivery of freight and merchandise in favor of the merchants and business men of Minden; that freight is delivered to the Minden merchants at or near their doors or platforms by the railroad, while, on the other hand, the same character of freight consigned to the Gardnerville merchants is unloaded at the freight depot and then transported to the Gardnerville stores at a cost of \$1 per ton.

RAILWAY LESS-THAN-CARLOAD FREIGHT SERVICE SLOW

Further, representative merchants of Gardnerville testified that the Virginia and Truckee Railway does not and will not transport freight in less-than-carload lots daily between Reno and Minden, and, in consequence, such shipments from Reno and California points are unreasonably delayed in transit at Reno and Carson City, waiting for carload lots to be accumulated before completing the haul and making delivery at Minden; that goods can be received directly at their store door from

Reno the same day as ordered when shipments are made by applicant's auto-truck line, whereas, if routed over protestant's railway the freight does not leave Reno until the following day and with transfer and lay-over at Carson City two or three days have elapsed from time of order before delivery is made at Minden, and thereafter they are put to the trouble and expense of having the freight transported from the depot to their stores in Gardnerville; that, if under present conditions and for the aforesaid reasons applicant's trucks are ordered off the run and they are unable to secure this expedited service, the merchants asserted that they would find it necessary to operate their own trucks between Gardnerville and Reno. Further, statement was also made that Gardnerville will donate depot site, right of way, and lands and will arrange with Ginocchio Brothers to discontinue operations between Gardnerville and Reno and arrange service for their trucks in other sections if the Virginia and Truckee Railway will extend its line into Gardnerville and render transportation service to and from there for the future.

JURISDICTION OF THE COMMISSION

The jurisdiction of the Commission and its power to act in a proceeding such as is here under consideration is made clear by reference to sections 7, 18, and 36½ of the Public Service Commission Law as amended and reenacted March 28, 1919, which are set forth below:

Sec. 7. The term "Public Utility" as used herein, shall mean and embrace all corporations, companies, individuals, associations of individuals, their lessees, trustees or receivers (appointed by any court whatsoever) that now or may hereafter own, operate, manage, or control any railroad or part of a railroad as a common carrier in this state, or cars or other equipment used thereon, or bridges, terminals, or sidetracks, or any docks or wharves or storage elevators used in connection therewith, whether owned by such railroads or otherwise; also any company or individual or association of individuals owning or operating automobiles, auto trucks, or other self-propelled vehicles, engaged in transporting persons or property for hire over and along the highways of this state as common carriers; also express companies, telegraph and telephone companies, and all companies which may own cars of any kind or character, used and operated as a part of railroad trains, in or through this state, and all duties required of and penalties imposed upon any railroad or any officer or agent thereof shall, in so far as the same are applicable, be required of and imposed upon the owner or operator of said automobiles, auto trucks, or other self-propelled vehicles, transporting persons or property for hire over and along the highways of this state as common carriers, express companies, telegraph and telephone companies, and companies which may own cars of any kind or character, used and operated as a part of railroad trains in or through this state, and their officers and agents, and the commission shall have the power of supervision and control of all such companies and individuals to the same extent as of railroads; *provided, however*, that automobiles used exclusively as hearses or ambulances operated within the limits of cities and towns, and other automobiles which have no specified routes of travel, and which are not operated as common carriers, shall not be construed as being under the jurisdiction of the commission within the meaning hereof. "Public Utility" shall also embrace every corporation, company, individual, association of individuals, their lessees, trustees or receivers appointed by any court whatsoever, that now or hereafter may own, operate or control any plant or equipment, or any part of a plant or equipment within the state for the production, delivery or furnishing for or to other persons, firms, associations, or corporations, private or municipal, heat, light, power in any form or by any agency, water for business, manufacturing, agricultural or household use, or sewerage service whether within the limits of municipalities, towns, or villages, or elsewhere; and the public service commission is hereby invested with full power of supervision, regulation and control of all such utilities, subject to the provisions of this act and to the exclusion of the jurisdiction, regulation and control of such utilities by any municipality, town, or village, unless otherwise provided by law.

(a).The provisions of this act and the term "Public Utility" shall apply to the transportation of passengers and property and the transmission of messages between points within the state, and to the receiving, switching, delivering, storing, and hauling of such property, and receiving and delivering messages, and to all charges connected therewith, including icing charges and mileage charges, and shall apply to all railroads, corporations, automobiles, auto trucks, or other self-propelled vehicles, express companies, car companies, freight and freight-line companies, and to all associations of persons, whether incorporated or otherwise, that shall do any business as common carriers upon or over any line of railroad or any public highway within this state, and to any common carrier engaged in the transportation of passengers and property, wholly by rail, or partly by rail and partly by water.

Sec. 18. The commission shall have power, in the interest of safety or service, after hearing, to determine and order required and necessary repairs, reinforcements or reconstruction of property, lines, equipment, appliances, buildings, tracks and all property used or useful in the service; to order the use of safety appliances in the interest of employees and the public, and to make and enforce any rule or regulation necessarily incident thereto; the commission shall have the power to require each automobile common carrier, subject to the provisions hereof, to file and keep in force with the commission an indemnity bond approved by the commission in an amount not less than five hundred (\$500) dollars nor more than ten thousand (\$10,000) dollars for the purpose of reimbursing passengers or shippers for loss or damage or personal injuries caused by the neglect of any automobile common carrier, its owner, operator, agent or employee.

The commission shall have the power to regulate the manner in which the tracks of any street, steam or electric railroad or other common carrier crosses the tracks of any other railway or common carrier, and prescribe such regulations and safety devices as may be necessary for the protection of the public and the prevention of accidents.

Sec. 36j. Every public utility owning, controlling, operating, or maintaining or having any contemplation of owning, controlling, or operating any public utility shall before beginning such operation or continuing of operations, or construction of any line, plant or system or any extension of a line, plant, or system within this state, obtain from the public service commission a certificate that the present or future public convenience or necessity requires or will require such continued operation or commencement of operations or construction; *provided*, that nothing herein shall be construed as requiring a public utility to secure such certificate for any extension within any town or city within which it shall theretofore have lawfully commenced operations or for an extension into territory either within or without the city or town contiguous to its railroad, line, plant or system and not then served by a public utility of like character. Upon the granting of any certificate of public convenience, the commission may make such order and prescribe such terms and conditions for the location of lines, plants, or systems to be constructed, extended or affected as may be just and reasonable.

Every applicant for a certificate of public convenience shall furnish such evidence of its corporate character and of its franchise or permits as may be required by the commission. The commission shall have the power, after hearing, to issue or refuse such certificate of public convenience or to issue it for the construction of a portion only of the contemplated line, plant or system or extension thereof, and may attach thereto such terms and conditions as, in its judgment, the public convenience and necessity may require.

No public utility beginning, prosecuting or completing any new construction in violation of this act shall be permitted to levy any tolls or charges for services rendered, and all such tolls and charges shall be void.

It shall be unlawful for any public utility to discontinue, modify or restrict service to any city, town, municipality, community, or territory theretofore served by it, except upon twenty (20) days' notice filed with the commission, specifying in detail the character and nature of the discontinuance, or restriction of the service intended, and upon order of the commission, made after hearing, permitting such discontinuance, modification or restriction of service.

All hearings and investigations under this section shall be conducted substantially as is provided for hearings and investigations of tolls, charges and service. Every order refusing or granting any certificates of public convenience, or granting or refusing permission to discontinue, modify or restrict service, as provided in this section, shall be prima facie lawful from the date of the order.

until changed or modified by the order of the commission or in pursuance of section 33 of this act; *provided, however*, that a municipality constructing, leasing, operating or maintaining any public utility shall not be required to obtain a certificate of convenience.

COMMISSION'S INTERPRETATION OF SECTION 36½

Section 36½ seems to clearly provide that applications for certificates of public convenience must be made to the Commission for authorization to continue the rendering, the extension, and the improvement of service by established public utilities, and by new or invading utilities where proposal is made to establish facilities for the rendering, extension, and improvement of the public service either in fields already served or in those where service has not theretofore been given.

In the investigation of applications for certificates of public convenience made by established or similar or improved public service agencies for authorization to operate within defined sections, the Commission understands that the following elements are, under the law, presented for consideration in reaching its conclusion authorizing or rejecting said applications:

That in so far as there may be no restriction to the natural progress and improvement in the art of rendering modern and efficient service, the investment and the business of an established utility where it has been wisely and beneficially made and the public is being adequately and economically served, should receive protection. In other words, the established utility's field of operations and business should be protected from invasion by a competing utility or utilities in those cases where only the same or an equivalent service is offered, or where it may reasonably appear that by the establishment of additional utilities the grade of a public service may be seriously impaired by such a division of the revenues available that ultimately the operations could not be profitably conducted and at the same time maintain the facilities in a proper state of efficiency. Further, in the same behalf, where the granting of the application of a competing utility or utilities would call for unnecessary investment and duplication of plant facilities and by the division of the earnings which would follow in the race for the survival of the fittest, it reasonably appears that the operations may result in loss to the investing public and serious impairment of the service, protection to the public should be accorded.

That in those cases, however, where it appears after hearing and investigation that a more modern and improved service and at better rates is offered upon the application of a new utility than is being afforded by the established utility occupying a given field, said established utility may be given an opportunity to modernize and extend its service facilities and operations and meet the rates in question offered if satisfactory showing is made that it is financially able and willing to do so within a reasonable time. In such cases it will not be unreasonable to afford protection to the established utility and exclude the incoming utility from establishing operations. But, if it is shown that the established utility is unable, without unreasonable delay and uncertainty, or if it refuses to modernize its facilities and meet the improvement in service and rates offered, it will then be justifiable and reasonable to grant the application and authorize the incoming utility to establish its business in the interest of progress and modern improvements in the art of rendering public service.

When two or more applications are before the Commission for determination covering similar or the same service conditions within a particular territory, or in the event that two or more competing utilities are already established, the question of priority in time and the question of the effective regulation of the utilities in such manner as will render proper service, while at the same time insuring a modern and adequate system of operating facilities, is entitled to consideration. In such cases the end sought will be the modernizing and the bringing of the facilities up to a satisfactory standard for the rendering of an adequate public service, and it therefore follows that effective regulation of facilities, rates, and practices should be enforced by the Commission in order to afford protection to the utility or utilities which can fully and beneficially serve the public and, at the same time, make sufficient revenues to properly maintain their system or systems and thereafter continue in the public service profitably.

Manifestly, the public service business has its limitations and, unless there is effective regulation of the utilities in question, and in certain cases a denial of the applications of incoming utilities for authority to participate in a public service in sections already adequately served, such unrestricted competition would result in obsolescence and deferred maintenance in the plant and facilities to such an extent that the public service would not only be badly demoralized, but also necessary improvements therein from time to time could not be afforded.

The established utility in point of time and service is, under the law, and subject to the aforesaid qualifications, entitled to the larger consideration, and, although no action can be authorized which will have the effect of impeding progress and improvements in the art of rendering public service, yet it may fairly be given the opportunity to reconstruct and make such improvement in its plant, system, or facilities, including the extension thereof, as will enable it to adequately meet the proposed competition in service and rates offered by the new utility. But, if the established utility elects not to make the improvements and extensions, including the establishment of the lower rates, proposed by the invading competitor, or is unable to do so, we are aware of no action which can, under the law, be taken to prevent the establishment of such improvements in service and rates to the public, nor do we think in such cases there should be any restriction exercised.

PROTESTANT SHOWS THAT APPLICANT FAILED TO COMPLY WITH LAWS OF 1907

Failure of applicant to comply with Railroad Commission law, as amended March 27, 1917, in the matter of filing rates, bond, and annual reports with the Commission, was established by protestant at the hearings, and for this reason it was urged by protestant that applicant is without standing as an established operating common carrier. In this behalf, the application is not for an extension of the applicant's service, and, as all public utilities are required to secure a certificate of public convenience and necessity from the Commission before beginning or continuing operations, under section 36½ as amended in 1919, we are unable to see that said failure changes the issues here presented for consideration. Following the enactment of said section, the Commission issued instructions to all public utilities to continue the rendering

of essential public service until such time as their applications could be filed, heard, and determined.

FEDERAL DEPARTMENTS CALL FOR MAXIMUM USE OF AUTO-TRUCK LINES TO RELIEVE RAILROADS FOR WAR PURPOSES

Following the amendment to the Railroad Commission law in 1917, defining automobile transportation lines as common carriers and making them subject to regulation as to their rates and reports and requiring the filing of surety bonds with the Commission, it may be noted that the world-wide war was upon us and that both the Council of National Defense and the Federal Railroad Administration were urging the people to ship by auto truck and aid the railroads in relieving freight congestion and car shortages to the fullest extent possible during the war emergency. As indicative of the necessity and the value which is still placed on the auto-truck lines as public-service agencies and as an auxiliary to the railways in relieving traffic congestion and car shortages, there is set forth below an appeal issued to the shipping public in the early fall of 1919 by Hon. Walker D. Hines, Director-General of the Federal Railroad Administration:

An unusually heavy grain-and-coal movement, deferred repair and construction of public highways in all sections of the country, and the concentrated requirement of suddenly reviving business, combined with the usual transportation requirements of this time of the year, threaten a serious lack of transportation facilities, unless all parties interested cooperate in securing the greatest possible utility from the existing limited transportation facilities. All shippers should assist in this work by loading all cars to capacity; by prompt loading and release to the carrier; by ordering cars only when actually required; and by *elimination of the use of railway equipment in such service where the tonnage can be handled by motor truck.*

IN RE BONDS AND DEPOTS

Regarding the bonds required by the Railroad Commission Act, section 7, as amended in 1917, it should be noted that "an indemnity bond issued by a company authorized to do business in the State of Nevada, in an amount not less than \$500 nor more than \$10,000," was required to be filed with the Commission; but as said companies were not prepared to accept this character of business it was impossible to enforce this provision. Inquiry is now being made by some surety companies preparatory to accepting this character of risk for the future. The Act of 1917 has been amended in this respect so that at present an ordinary indemnity bond is specified and all auto transportation companies are being required to execute and file such bonds with the Commission as rapidly as their applications for certificates of public convenience and necessity can be heard and decided.

Protestant's contention that applicant be required to establish depots in the same manner as required of the railroads by section 22 of the Public Service Commission Act is not well grounded, for the reason that the auto-truck line makes direct delivery and receipt of traffic. In other words, it performs a complete terminal service in connection with its line haul, and therefore eliminates the necessity of delivery and storage of freight in a depot until called for or shipped out as is the case with railroads. However, in the interest of the public service, we are of the opinion that applicant should be required to establish an agency point within each town or city served where messages for

service and the receipt and delivery of package freight can be taken care of.

RAILROAD TOWNSITE CONTROVERSY

There has been energetic effort made by the people of Gardnerville to secure rail service from protestant ever since the Minden branch line was built from Carson City in 1905, and bitter complaint has been freely made at every opportunity presented against the old indefensible railroad policy of establishing terminals (after the purchase or donation of land) and promoting and building up a rival town at the expense of some near-by city or town. It need not be inquired into or explained at this time why such a policy has been followed by the railways of the country, but the fact that such action has been freely taken is one of the underlying causes of public hostility to the railroads. The people of Gardnerville have long maintained that in consideration of a free right-of-way grant, protestant agreed to and did make its terminal at Minden, instead of building into or through Gardnerville, which, from a construction standpoint, could have been done easily and economically. In this connection, Attorney F. E. Murphy, for the Virginia and Truckee Railway, testified in this proceeding as follows, regarding his company's failure to build into and render service to Gardnerville (page 40, Record of October 11, 1919) :

SHAUGHNESSY—Is there any contractual reason why the V. and T. cannot build into Gardnerville?

MURPHY—Our right of way does not extend to Gardnerville.

SHAUGHNESSY—Could those rights of way be secured and, if secured, would there be any violation of a contract on previous right-of-way grants that would prevent you?

MURPHY—Not excepting the extension up to the right-of-way fence.

SHAUGHNESSY—I mean the extension of your line from Minden to Gardnerville. Is that prevented by contractual agreements relating to right-of-way grants?

MURPHY—I don't believe so.

SHAUGHNESSY—Were such agreements as that entered into? That is very freely charged in all of these proceedings.

MURPHY—I presume that there was an agreement that we would not build beyond that right of way that was granted. Regarding the matter of building closer to Gardnerville—Gardnerville was antagonistic and they did not feel that the railroad would be built up there and no right of way was granted and, in fact, we were given to understand that there would be no right of way granted.

SIMMONS—At what time was that?

MURPHY—In 1905. But the principal reason for the location of the road was the extension out to the new country beyond. There is a very valuable mining property out there and it is as valuable today as it was then, and I presume the only reason that it is not exploited is because of the price the present owners hold it for. I refer to the Loope District in Alpine County.

Further, with a view to effectuating if possible a joint rail and truck-line service between Reno and Gardnerville, the following questions were asked of and answered by Attorney Murphy at the original hearing on July 28, 1919 :

SHAUGHNESSY—In working out the competitive features here involved, and also the additional service which the auto truck seems to bring to the public, would your company be in a position to consider the establishment of a delivery service on the business that is here being considered from the warehouse at the point of purchase to the store door at point of delivery?

MURPHY—That could not be considered, because we have been notified that any rates issued must be in accordance with federal traffic regulations.

SHAUGHNESSY—But they would listen to your appeal, would they not?

MURPHY—I doubt very much if they would permit any consideration of that in the issuance of a rate.

SHAUGHNESSY—Of course that remains to be seen; but I am suggesting the establishment of this service either by ownership of the facilities by the railroad or through joint operation with the established auto carriers.

MURPHY—The truth of the matter is that, on a proposition of that kind—the establishment of such delivery service—the loss would probably be greater than the amount we lose through auto competition.

RAILROAD INCOME DIMINISHING—CARLOAD RATES TOO LOW

Protestant contends that the application here under consideration to continue the operation of an auto-truck line between the aforesaid points should be denied because it reduces railroad revenues and that because of increased costs of labor, material and supplies its net earnings are diminishing and have fallen to \$8,845 for the year ending June 30, 1919. This is a return of only 6% on a capital investment of \$147,000, whereas the reproduction cost of the line is not less than one million dollars. It may therefore be noted that under present operating conditions the earnings of the company are inadequate.

Charges for railway freight service between Reno and Minden vary according to classification. The first five classes maintained by protestant will perhaps cover the bulk of the traffic which is handled by applicant at a rate of \$8 per ton from warehouse receipt to store-door delivery; whereas the average charge made by protestant from freight depot to freight depot is about \$8 per ton, and, when terminal and cartage charges approximating \$1 per ton between warehouse and stores and the depots at Reno and Gardnerville are added, the railroad transportation and terminal charges covering said five classes of freight traffic will average about \$10 per ton. If the average of the entire ten classes of the railroad is taken, it may be stated that the transportation charges between the aforesaid points amount to \$6 per ton, or \$8 per ton when terminal receipt and delivery charges are added as aforesaid.

In this behalf, however, it should be noted that these rates cover only a very small proportion of protestant's freight business. The great bulk of it is handled in carloads under special commodity rates which range from an average of 80 cents per ton up to \$5 per ton. Hay, grain, flour, lumber, structural steel and iron, farming implements and junk are transported between Minden and Reno at a rate of \$2.50 per ton. Likewise sheep and hogs are transported at a rate of \$2.60 per ton and cattle at a rate of \$3 per ton. Plaster and gypsum are shipped in carloads averaging 40 tons each from Mound House to Reno, a distance of 41 miles. In rendering this service there is involved the movement of empty cars inbound from Reno and after switching and loading at Mound House, the return or outbound movement of the loaded cars to Reno, at a rate of \$1.20 per ton if the shipment is local and destined to Reno, but if it is destined to San Francisco and various other California points, where the bulk of this commodity is disposed of, protestant's proportion of the through joint rate with the Southern Pacific lines is only 80 cents per ton.

Further in this behalf, it may be noted from protestant's reports on file with this Commission that the total freight commodities handled for the year ending December 31, 1918, amounted to 104,519 tons, of which 79,242 tons originated on protestant's lines. In this connection 52,529 tons or 50.25% of protestant's entire freight traffic is plaster and gypsum moving from Mound House and that, with the exception of

only a few carloads sold within our State, this commodity is shipped to California points. The through joint rate from Mound House to San Francisco Bay points is \$3.40 per ton, out of which protestant receives as its division the aforesaid 80 cents per ton. The Virginia and Truckee Railroad initiates this traffic on its line, performs a double transportation haul of the cars and does all of the switching at Mound House and in addition thereto delivers the loaded cars to the Southern Pacific line at Reno ready to be placed in a through-freight train for transportation to California points. This service and also that of originating and delivering various other interline shipments of live stock, manufactured commodities, and the products of the mines, of the soil, and of the forest is exceedingly valuable to the Southern Pacific Company for the reason that protestant's line serves an important section of Nevada and furnishes a large tonnage of interline traffic to the Southern Pacific Company, from which it follows that the line is a highly profitable feeder to said company. We are therefore of the opinion that the Virginia and Truckee Railroad should not be required to take less than its local rate covering the originating, the delivering and switching movements of low-grade commodities such as plaster and gypsum.

Further, 7,934 tons of agricultural products were handled by protestant's line during said year of 1918, 75% of which originated in Carson Valley and moved out from Minden to Reno at a rate of \$2.50 per ton. During the same period 7,396 tons of live stock were transported, 90% of which originated in Carson Valley and moved to Reno at a rate of \$2.60 per ton for sheep and hogs and \$3 per ton for cattle.

The freight earnings made by protestant's railroad during said year 1918 were \$168,897, from which it is to be observed that for the handling of the aforesaid 104,519 tons of freight the average earnings were only \$1.62 per ton. This brief analysis of railway freight statistics speaks for itself and indicates that there is a fair margin within which protestant's rates may bear such reasonable increases as will enable it to further modernize its facilities and rearrange its services sufficiently to meet changing transportation and economic conditions and at the same time pay a reasonable return upon the fair present value of the property beneficially devoted to the use of the public.

STANDARD RAILROAD EQUIPMENT OBSOLETE FOR RENDERING LOCAL SHORT-HAUL SERVICE

Heretofore the railroads have depended upon rendering both their carload and their less-than-carload freight services on a slow-moving local freight train, including unreasonable transfer delays to less-than-carload shipments at junction points, which has resulted in turning the shipping public to the use of direct auto-truck-line transportation covering 25- to 100-mile hauls. It is conceivable that if the railways desire to retain this less-than-carload freight business they may provide a more flexible and direct train service between points on their lines. This might be accomplished by motorizing the rails for freight service somewhat along the same lines followed in the operation of motor passenger car train service. It has been proven that the motor passenger car is an economical train unit and affords a highly attractive and expeditious service to the public. It has also been found that the cost

of their operation compared to steam-train operation is very economical. For example, in an investigation made by the Commission during 1919, it was shown that the operation of a suburban passenger railway train round-trip service between Ely and McGill, a distance of approximately 30 miles, cost \$52 per day for train crews, coal, oil, and ordinary repairs, whereas the cost, including depreciation, for the operation of an 84-passenger seating capacity McKeen motor car train service over an equivalent distance on the Virginia and Truckee Railway was found to be approximately one-third this amount.

Railroad local freight-train equipment and service of today is obsolete. It is too slow for comparatively short-haul less-than-carload freight and express service and entirely too wasteful in its costs of operation under present methods. The average weight of train equipment and locomotives used will average approximately 25 tons per car and, while the carrying capacity is in excess of 42 tons per car, the loaded weight for said local service will not average to exceed $7\frac{1}{2}$ tons. It therefore may be noted that, in rendering this service, the load factor is only 18%, and that there is therefore a nonproductive excess capacity of 82% in the cars used, and further, that $3\frac{1}{2}$ tons of dead weight, producing excessive operating cost, is employed in moving each ton of freight. This necessarily makes the less-than-carload service slow and costly, because of efforts to handle in connection with and as other traffic in carload lots seem to justify; and entirely too costly if handled in separate trains in competition with direct auto line service.

The short-line railroads complain that the auto trucks take from them what has heretofore been their exclusive high-rate less-than-carload freight and express business, covering distances from 25 to 100 miles. But no solution is offered by them for the extended and cheaper transportation service afforded the public by the motor-truck lines. Manifestly, the railroads through their well-established financial, operating and shop organizations, can establish motor car and trailer passenger, freight and express train services, which shall enable them to profitably retain to their lines much of the traffic that under present heavy and wasteful steam-train operations is being lost to the modern auto-truck and stage lines.

AUTO-TRUCK AND STAGE LINES EXCEEDINGLY VALUABLE IN DEVELOPMENT OF AGRICULTURAL, LIVESTOCK, AND MINING DISTRICTS OF NEVADA

Under established national and state policy hundreds of millions of dollars are annually being raised and expended for highway development and improvements for the promotion of quicker and cheaper transportation to the people. In this behalf, it is estimated that the aggregate expenditures on highway construction to be made by the federal, state and county governments during the current year will be one billion dollars. Further, large capital is invested in the automobile industry, and, in consideration of the flexible and expeditious service which auto-truck and stage lines render to the farmer, the mercantile shipper, and the traveling public, this improved transportation agency is meeting with deserved approval and encouragement, and it must therefore be recognized that it has come to stay.

It may also be noted, in passing, that the commercial shippers find

the extended service afforded by the auto-truck lines attractive and valuable for the reason that there is an added convenience and adaptability in shipments not heretofore furnished. It is largely free from boxing and packing regulations and from the trouble of billing and drayage, and it is also practically free from damage in transit and of delay in tracing lost and astray goods. This makes an impression on customers that thus far has not been afforded in any other way. The service in question has also grown to a point where it is strongly appealing to the farmer as well as to the commercial and retail-trade interests. With the trucks of a motor freight and express line operating on daily schedule past his place on the way to markets in near-by cities, the farmer is beginning to ship to market his surplus milk, cream, eggs, garden products, etc., as economically, or more so, than by rendering the service himself. It is also found highly advantageous because the farmer does not need to give the time of himself or that of his employees to the transportation of his products to market, and he is thereby enabled to spend this time and energy in the more important work of raising additional and better crops and live stock for the market.

For the reasons stated herein, we believe it must be recognized that there is now an established field for both the railroads and the auto-stage, truck, freight, passenger, express and mail lines. Further, that all of these agencies should for the future be established and regulated in the interests of the public service, and that this may be accomplished by the independent operation of each in certain section, and in others by the joint operation of the auto-stage-truck and railroad lines in proportion as the public necessity and convenience may justify.

The people of Nevada are opposed to laying any undue restriction upon auto transportation development and service and this is especially true throughout the agricultural, livestock and mining sections of our State. The birth of many rich mining camps of today and for several years past has been and is synonymous with the potential possibilities and the services actually rendered by automobile transportation facilities. For example, rapid transit in Southern Nevada during the mining development which began more than twelve years ago, was the paramount issue and the question of rates, convenience and personal safety were minor considerations—necessity and time being the real factors of importance, as fortunes were at stake and fortunes were being spent to make them. With these factors presented it afforded an opportunity to the desert auto drivers to overcome obstacles mechanically and physically from a road-negotiating standpoint, which, under ordinary economic conditions, would have been insurmountable. The knowledge gained by these automobile transportation pioneers and the standards called for in automobiles, auto trucks and stages to meet these hazardous and exacting conditions have played an exceedingly important part in the present high state of development of the modern auto passenger and freight cars. Nevada has therefore contributed largely to the development of the automobile passenger and truck car standards of today and therefore, because of the increasing necessity for their use in developing our State, action should not be taken that will result in unreasonably restricting the important and growing value of this transportation agency.

TESTIMONY ESTABLISHES NECESSITY FOR THE CONTINUED OPERATION OF BOTH RAILWAY AND AUTO-TRUCK SERVICES

Under present railway operating conditions the testimony establishes that there is a clear and definite necessity for the continued operation of both the railway and the auto-truck services under consideration in this case—the railway for the purpose of continuing its present high-grade passenger, express and carload freight services between Reno and Minden, and the auto-truck line for the purpose of according to the people of Gardnerville and points intermediate an extended less-than-carload freight service. In this behalf, it must be recognized that Gardnerville is fairly entitled to transportation service and that the same has not been and is not now being furnished by the Virginia and Truckee Railway. It must also be noted from the testimony of record that protestant is unwilling to take any steps toward retaining its diminishing earnings (which it claims the aforesaid automobile truck line is accountable for to some extent) by extending service to the town of Gardnerville and by the performance of terminal receipt and delivery service, which is being furnished by applicant. Further, from a service standpoint, applicant's complaint that protestant's less-than-carload freight service between Reno and Gardnerville is inadequate has been established by protestant's traffic manager, who testified that while less-than-carload shipments were moved and delivered daily (except Sunday) between Reno and Carson City, such shipments were moved into and out of Minden but two or three times a week (pp. 48-49, Record of October 11, 1919).

After full hearing and investigation of all of the issues raised in this proceeding, the Commission is of the opinion that the application of Ginocchio Brothers to operate an auto-truck line freight service between Reno and Gardnerville, including points intermediate, should be granted, with the understanding that compliance with the law and rules and regulations of the Commission shall be strictly enforced for the future, including the filing of an indemnity bond of \$10,000.

An order will be entered accordingly.

ORDER

At a general session of the Public Service Commission of Nevada, held at its offices in Carson City, Nevada, on the 27th day of December, A. D. 1919:

Present—Chairman J. F. Shaughnessy, Commissioner W. H. Simmons, Commissioner J. G. Scrugham.

Pursuant to the foregoing opinion, it is hereby

ORDERED: That the application of Ginocchio Brothers for a certificate of public convenience be granted authorizing them to operate a triweekly auto-truck line freight service between Reno and Gardnerville and intermediate points: It is further

ORDERED: That Ginocchio Brothers shall establish an agency point in each city and town served by its line where messages for service and the receipt and delivery of package freight can be taken care of. It is further

ORDERED: That the law and all rules and regulations of the Public

Service Commission shall be complied with in the matter of filing rates, schedules, annual and special reports as requested, and an indemnity bond, on or before the 1st day of February, 1920; and that such compliance be continued in the future. It is further

ORDERED: That said Ginocchio Brothers shall on or before February 1, 1920, file with the Public Service Commission an indemnity bond in the sum of ten thousand dollars (\$10,000), the same to be executed by good and sufficient sureties who are able to qualify in the amount in question. Said bond shall be approved by the District Attorney of either Washoe or Douglas Counties.

BY THE COMMISSION,

[SEAL]

STELLA G. COLCORD,
Acting Secretary.

Dated January 24, 1920.



STATE OF NEVADA

ORDER OF DETERMINATION OF RELATIVE RIGHTS

TO THE

Waters of the Muddy River and Its Tributaries

J. G. SCRUGHAM, State Engineer



CARSON CITY, NEVADA

STATE PRINTING OFFICE : : : JOE FARNSWORTH, SUPERINTENDENT
1920



ORDER OF DETERMINATION

In the Matter of the Determination of the Relative Rights in and to the Waters of the Muddy River and its Tributaries in Clark County, State of Nevada.

In accordance with stipulated agreement entered into by the Muddy Valley Irrigation Company, et al., v. Moapa and Salt Lake Produce Company, et al., on the 23d day of April, 1919, an order was entered in the Tenth Judicial District Court of the State of Nevada referring the above-entitled action to the State Engineer for an adjudication of the water rights on the Muddy River stream-system as provided for in Chapter 140, Statutes of 1913, and all Acts amendatory thereof.

The tabulation of the allotments of the waters of the Muddy River stream-system, as attached hereto, covers all claims filed in the office of the State Engineer as provided for by law, and also an allotment to the Moapa Indian Reservation. Although duly notified of the pending adjudication proceedings in the statutory manner, the United States Indian Service authorities did not file a claim and state that they refuse to recognize the authority of the State of Nevada to determine the water rights of the Moapa Indian Reservation. In the absence of any showing on part of the United States Indian Service, the State Engineer has based the Moapa Indian Reservation allotment on the official investigations and reports made in the year 1906 by Henry Thurtell, at that time State Engineer of Nevada. These reports gave the Moapa Indian Reservation an allotment of water sufficient to properly irrigate an area of 87 acres, which was found to be the full area on the Reservation entitled to a vested water right under the law of the State.

(a) Duty and point of diversion defined.

The duty of water allowed for all land in the Muddy River Valley shall be 1 c.f.s. flow to 70 acres for the summer irrigation season from April 1 to October 1 and 1 c.f.s. flow to 100 acres for the winter irrigation season from October 1 to April 1.

The volumes or amounts of water allotted and to which it is agreed the respective parties are entitled shall be understood to include and define the amount of all the waters now or heretofore rightfully used on the lands given in the tabulation whether diverted directly from said Muddy River or from its tributaries, springs, headwaters or other sources of supply, including water claimed to have been developed heretofore by any of the said parties. All measurements of amounts diverted are to be made at the point where the main ditch enters or becomes adjacent to the land to be irrigated or as near thereto as practicable, as the State Engineer or water commissioner may select or approve.

(b) Baldwin Spring flow defined.

The maximum flow of .8298 c.f.s. of water of the George Baldwin Spring now and heretofore used by George Baldwin and Aletha L. Baldwin, his wife, is water which has been developed by said parties.

Such development and use of this amount of water has not and does not diminish the flow or volume of the Muddy River, or interfere with the rights of any other water users on the stream-system. No further development of water on the head of the Muddy River stream-system shall be made which in any way diminishes the flow of the waters of the Muddy River or impairs rights defined and referred to in this order.

(c) *Method of use.*

The parties named in this order shall not be required to take or use the water of said river in continuous flow, but may cumulate same or any part thereof in rotation and in periodic turn, with the approval of the water commissioner, subject to his control and direction and under such rules and regulations as are prescribed by the State Engineer and the statutes of the State of Nevada.

The whole amount of water diverted from the river at any one time by all the parties allotted water for use above the "narrows" is not to exceed in the aggregate the total amount of water allotted to the several parties resident in the Upper Muddy Valley. Below the lowest diversion of Knox and Holmes the flow in the stream shall be maintained substantially constant subject to seasonal variation. The whole of said river system shall be under supervision of the rules and regulations of the State Engineer and the direction and control of the water commissioner, to be appointed as provided by law. Substantial headgates, weirs, and sand-boxes, as the State Engineer through the water commissioner may order, shall be installed and maintained in good order by all who divert or use the waters of said stream-system.

(d) *Channel upkeep, responsibility for.*

The owners of land on that part of said river above the "narrows" shall keep the channel through their respective lands cleared of all ordinary obstructions, but in case of extraordinary obstruction, such as the formation of lime deposits in the channel of the stream, the same shall be removed under the direction of the water commissioner and the expenses thereof paid pro rata by all parties to this determination in proportion to the acreage owned or controlled by them as defined in this order.

(e) *Priority—Vested and granted rights.*

All the water rights enumerated in this order of determination, except those held under permit from the State Engineer's office, shall be deemed and held to be vested rights acquired by valid appropriation and beneficial use prior to March 1, 1905, and by continued uninterrupted use since said date and shall be considered as equal in rank without having any priority over one another.

Permits Nos. 31 and 1372, which are the basis for certificates Nos. 58, 59, and 60, granted by the State Engineer, cover certain water rights which are enumerated in the appended tabulation of allotments. These granted rights are next in priority to the vested rights on the Muddy River stream-system.

(f) *Losses, apportionment of.*

All abnormal losses from the flow of said stream shall be pro-rated and shared among the parties holding water rights on the stream. Abnormal losses shall include any substantial loss from the permanent

flow of the stream, such as a cloudburst destroying or obstructing the channel thereof or an opening up of a fissure in the bed of the stream or in one of the sources of supply and the disappearance therein of a substantial amount of the waters, thereby causing a diminution in the available flow.

If any such abnormal loss occurs at any time, the pro-rata share of such loss to be borne by each party to this order shall be as follows:

George Baldwin and Aletha Baldwin, his wife.....	16/2839
Moapa & Salt Lake Produce Co.....	155/2839
Livingston & Smith.....	160/2839
Joseph Perkins and wife.....	30/2839
Knox and Holmes.....	95/2839
Isalah Cox and wife.....	10/2839
W. J. Powers and wife.....	29/2839
Sadie George.....	2.1/2839
Jacob Bloedel.....	2/2839
J. H. Mitchell.....	3/2839
U. S. Indian Service, Moapa Reservation.....	87/2839
John F. Perkins.....	2/2839
Muddy Valley Irrigation Co.....	2244.80/2839

(g) *Expense of commissioner.*

The salary and expenses of the water commissioner shall be paid pro rata by all parties to this adjudication in the proportion of acreage owned and controlled by them as defined in this order.

SUMMARY OF ALLOTMENTS AND CERTIFICATES

<i>Claimant</i>	<i>Acreage</i>	<i>C.F.S. flow</i>	
		<i>Summer</i>	<i>Winter</i>
Jacob Bloedel.....	2	.0286	.02
Moapa & Salt Lake Produce Co.....	155	2.215	0
Isalah Cox and wife.....	10	.143	0
J. H. Mitchell.....	3	.043	0
George Baldwin.....	16	.2286	0
Sadie George.....	2.1	.0300	0
John F. Perkins.....	2	.0286	.02
Los Angeles & Salt Lake Ry.....		.04646	.04646
Livingston and Smith.....	100	2.286	0
Knox and Holmes.....	95	1.357	0
W. J. Powers.....	29	.4143	.29
Muddy Valley Irr. Co.....	2244.80	32.0068	22.448
Muddy Valley Irr. Co.(Cert. 58).....	398.11		3.98
Muddy Valley Irr. Co.(Cert. 59).....	425.2	4.252	
	846.6		8.466
Muddy Valley Irr. Co.(Cert. 60).....	80		.8
Joseph Perkins.....	30	.428	0
Moapa Indian Reservation.....	87	1.242	.87

Appropriator—Jacob Bloedel.

Source—Muddy River Tributary (Bloedel Spring).

<i>Ditch Title</i>	<i>Date when construction commenced</i>	<i>Date when land first irrigated</i>	<i>Number of acres irrigated</i>	<i>Sec.</i>	<i>Subdivision</i>	<i>Tp.</i>	<i>S.</i>	<i>R.</i>	<i>E.</i>
Morris & Jones Ditches.....	1896		2.00	21	NE½NE½	14			65
Domestic use allowed.									
2/70 c.f.s. allowed for irrigation.									

Appropriator—Moapa and Salt Lake Produce Co.

Source—Muddy River and Tributaries.

Big Spring, Jones Spring, High Springs, and Rock Cabin Spring Ditches.	14	W½SW½	14	65
	15	S½	14	65
	15	S½NW½	14	65
	15	S½NE½	14	65
	16	NE½	14	65
	16	E½SE½	14	65
Excepting and excluding from the above description the.....	16	NE½		
	16	NW½NE½	14	65
	16	NW½		
		NE½NE½	14	65

Domestic use allowed.
Total acreage allotted water, 155 acres.
2 and 15/70 c.f.s. allowed for irrigation.

Appropriator—Isalah Cox and Anna Cox, His Wife.

Source—Muddy River and Tributaries.

Cox Ditch and Cox Spring Ditch.	10.00	16	NE½	
			NW½NE½	14 65

Domestic use allowed.
10/70 c.f.s. allowed for irrigation.

Appropriator—J. H. Mitchell.

Source—Muddy River.

Mowry & Mitchell or Cox Ditch...	3.00	16	NW½	
			NE½NE½	14 65

Domestic use allowed.
3/70 c.f.s. allowed for irrigation.

Appropriator—U. S. Indian Service (Moapa Indian Reservation).

Source—Muddy River.

Indian Ditches.....	87.00	36		14 65
		35		14 65
		31		14 66
		1		15 65
		6		15 66

Total..... 87.00

This allotment is based on the Thurtell findings as covered in Certificate No. 479, issued by Henry Thurtell on March 30, 1907.

Domestic use allowed.
87/70 c.f.s. allowed for irrigation.

Appropriator—George Baldwin.

Source—Muddy River and Tributaries.

<i>Ditch Title</i>	<i>Date when construction commenced</i>	<i>Date when land first irrigated</i>	<i>Number of acres irrigated</i>	<i>Sec.</i>	<i>Subdivision</i>	<i>Tp.S. R.E.</i>
George A. Davis and Dry Ditch...			16.00	25	SE $\frac{1}{4}$ SW $\frac{1}{4}$	14 66
				25	SW $\frac{1}{4}$ SE $\frac{1}{4}$	14 66
				36	Lots 2 and 3 NE $\frac{1}{4}$	14 66

Domestic use allowed.
16/70 c.f.s. allowed for irrigation.

Appropriator—Sadie George.

Source—Muddy River and Tributaries.

Indian Ditch.....			2.10	1	SE $\frac{1}{4}$ NE $\frac{1}{4}$	15 66

Domestic use allowed.
21/700 c.f.s. allowed for irrigation.

Appropriator—Joseph Perkins.

Source—Muddy River and Tributaries.

Barnes & Harris Ditch and Bradfute Ditch.			30.00	6	Lots 4 and 5 NW $\frac{1}{4}$	15 66
				6	Lot 6 SW $\frac{1}{4}$	15 66
				6	SE $\frac{1}{4}$ NE $\frac{1}{4}$	15 66
				6	SW $\frac{1}{4}$ NE $\frac{1}{4}$	15 66
				6	Lots 2 and 3	15 66

Domestic use allowed.
30/70 c.f.s. allowed for irrigation.

Appropriator—Los Angeles and Salt Lake Ry. Co.

Source—Muddy River.

Pipe Line.....				equiv. to .0322	32	NE $\frac{1}{4}$	14 66
NOTE—Water used for locomotives, cars, depot, stock yards, and town supply. .04646 c.f.s. allowed.							

Appropriator—D. H. Livingston and Richard Smith.

Source—Muddy River and Tributaries.

White, Livingston, and Crosby Ditches.				5	S $\frac{1}{4}$ SE $\frac{1}{4}$	15 66
				8	N $\frac{1}{4}$ NE $\frac{1}{4}$	15 66
				9	N $\frac{1}{4}$ NW $\frac{1}{4}$	15 66
				9	NW $\frac{1}{4}$ NE $\frac{1}{4}$	15 66
				4	SW $\frac{1}{4}$ SE $\frac{1}{4}$	15 66
				4	SE $\frac{1}{4}$ SW $\frac{1}{4}$	15 66
			20.00	4	N $\frac{1}{4}$ SE $\frac{1}{4}$	15 66
				9	NE $\frac{1}{4}$ NE $\frac{1}{4}$	15 66
				4	SE $\frac{1}{4}$ SE $\frac{1}{4}$	15 66
				3	W $\frac{1}{4}$ SW $\frac{1}{4}$	15 66
				8	N $\frac{1}{4}$ NW $\frac{1}{4}$	15 66
				5	S $\frac{1}{4}$ SW $\frac{1}{4}$	15 66
				6	S $\frac{1}{4}$ SE $\frac{1}{4}$ situated east of the R. R. track	
All that portion of.....						
Total.....			160.00			

Domestic use allowed.
2 and 20/70 c.f.s. allowed for irrigation.

Appropriator—G. S. Holmes and Julia May Knox.

Source—Muddy River and Tributaries.

<i>Ditch Title</i>	<i>Date when construction commenced</i>	<i>Date when land first irrigated</i>	<i>Number of acres irrigated</i>	<i>Sec.</i>	<i>Subdivision</i>	<i>Tp.</i>	<i>S.</i>	<i>R.</i>	<i>E.</i>
Weiser Ditch.....			95.00	1	S½NW½SW¼	15			66
				1	S½SW¼	15			66
				1	S½SE¼	15			66
				12	NE¼	15			66
				12	NE½SE¼	15			66
				7	SW¼NW¼	15			67
				7	NE½SW¼	15			67
				7	Frac. ½SW¼	15			67

Domestic use allowed.

1 and 25/70 c.f.s. allowed for irrigation.

Appropriator—W. J. Powers.

Source—Muddy River.

Cook Ditch.....	29.00	4	NW½SE¼	15	66
		4	NE½SE¼	15	66
		4	NW½SE¼	15	66
		4	NE½SW¼	15	66
		4	NE½SE¼	15	66
		4	SE½NE¼	15	66
		3	NW½SW¼	15	66

Domestic use allowed.

29/70 c.f.s. allowed for irrigation.

Appropriator—Muddy Valley Irrigation Co.

Source—Muddy River.

St. Joe Ditch.....	20.00	15	SE½SW¼		
	14.00	15	SW½SW¼		
	84.00	15		15	67
	20.00	21	SE½NE¼		
	7.25	21	NE½NE¼		
	27.25	21		15	67
	20.00	22	NE½NW¼		
	24.00	22	SE½NW¼		
	14.00	22	NW½NW¼		
	14.00	22	SW½NW¼		
	14.00	22	NW½SW¼		
	14.00	22	NE½SW¼		
	15.00	22	SW½SW¼		
	20.00	22	NW½NE¼		
	20.00	22	SW½NE¼		
	15.00	22	NW½SE¼		
	14.00	22	SE½SW¼		
	184.00	22		15	67
	14.00	27	NE½NW¼		
	14.00	27	NW½NE¼		
	16.50	27	SW½NE¼		
	30.00	27	SE½NE¼		
	26.00	27	NE½SE¼		
	10.00	27	SE½SE¼		
	110.50	27		15	67
	2.60	28	SW½NW¼		
	24.40	28	NW½SW¼		
	3.00	28	SW½SW¼		
	30.00	28		15	67
	17.50	35	SE½NW¼		
	40.00	35	NW½NW¼		
	20.00	35	NE½NW¼		
	77.50	35		15	67
Total.....	463.25				

46325/7000 c.f.s. allowed for irrigation.

Appropriator—Muddy Valley Irrigation Co.

Source—Muddy River.

<i>Ditch Title</i>	<i>Date when construction commenced</i>	<i>Date when land first irrigated</i>	<i>Number of acres irrigated</i>	<i>Sec.</i>	<i>Subdivision</i>	<i>Tp.S. R.E.</i>
Sprole-Averitt.....			22.25	27	NW¼NW¼	
			25.00	27	SW¼NW¼	
			10.00	27	SE¼NW¼	
			35.50	27	NE¼SW¼	
			22.50	27	SE¼SW¼	
			28.00	27	SW¼SE¼	
			<hr/>			
			143.25	27		
			6.00	34	NE¼NW¼	15 67
			15.00	34	SE¼NW¼	
			17.75	34	NE¼NE¼	
			40.00	34	NE¼NE¼	
			13.75	34	SW¼NE¼	
			6.50	34	SE¼SE¼	
			<hr/>			
			99.00	34		15 67
Total.....			242.25			

24225/7000 c.f.s. allowed for irrigation.

Appropriator—Muddy Valley Irrigation Co.

Source—Muddy River.

Kapalapa Ditch.....			10.00	2	NW¼NW¼	
			20.00	2	NE¼NW¼	
			20.00	2	SE¼NW¼	
			20.00	2	NW¼NE¼	
			7.50	2	NE¼NE¼	
			20.00	2	SE¼NE¼	
			20.00	2	SW¼NE¼	
			20.00	2	NW¼SE¼	
			20.00	2	NE¼SW¼	
			<hr/>			
			157.50	2		16 67
Total.....			157.50			

15750/7000 c.f.s. allowed for irrigation.

Appropriator—Muddy Valley Irrigation Co.

Source—Muddy River.

Stringtown Ditch.....			17.80	12	NE¼NW¼	
			12.50	12	SW¼NW¼	
			12.50	12	SE¼NW¼	
			7.50	12	SW¼NE¼	
			12.00	12	NE¼SE¼	
			30.00	12	NW¼SE¼	
			36.20	12	SW¼SE¼	
			24.10	12	SE¼SE¼	
			7.00	12	NE¼SW¼	
			15.00	12	SE¼SW¼	
			8.00	12	SW¼SW¼	
			<hr/>			
			182.60	12		16 67
			21.40	13	NW¼NE¼	
			25.80	13	NE¼NE¼	
			<hr/>			
			47.20	13		16 67
			5.00	18	SW¼NW¼	
			5.00	18	NW¼NW¼	
			<hr/>			
			10.00	18		16 68
Total.....			239.80			

23980/7000 c.f.s. allowed for irrigation.

Appropriator—Muddy Valley Irrigation Co.

Source—Muddy River.

<i>Ditch Title</i>	<i>Date when construction commenced</i>	<i>Date when land first irrigated</i>	<i>Number of acres irrigated</i>	<i>Sec.</i>	<i>Subdivision</i>	<i>Tp.S.</i>	<i>R.E.</i>
Sparks Canal.....			18.00	1	SE $\frac{1}{4}$ SW $\frac{1}{4}$	16	67
			21.80	7	SW $\frac{1}{4}$ SW $\frac{1}{4}$		
			1.20	7	NW $\frac{1}{4}$ SW $\frac{1}{4}$		
			23.00	7		16	68
			1.80	12	NE $\frac{1}{4}$ SE $\frac{1}{4}$		
			8.20	12	SE $\frac{1}{4}$ SE $\frac{1}{4}$		
Total.....			10.00	12		16	67
			46.00				

46/70 c.f.s. allowed for irrigation.

Appropriator—Muddy Valley Irrigation Co.

Source—Muddy River.

Overton Canal.....	18.00	2	SW $\frac{1}{4}$ SE $\frac{1}{4}$		
	20.00	2	SE $\frac{1}{4}$ SW $\frac{1}{4}$		
	12.00	2	SW $\frac{1}{4}$ SW $\frac{1}{4}$		
	50.00	2		16	67
	7.00	3	SE $\frac{1}{4}$ SE $\frac{1}{4}$	16	67
	5.00	10	NE $\frac{1}{4}$ NE $\frac{1}{4}$	16	67
	10.00	11	NW $\frac{1}{4}$ NW $\frac{1}{4}$		
	20.00	11	NE $\frac{1}{4}$ NW $\frac{1}{4}$		
	20.00	11	NW $\frac{1}{4}$ NE $\frac{1}{4}$		
	13.475	11	NE $\frac{1}{4}$ NE $\frac{1}{4}$		
	7.50	11	SE $\frac{1}{4}$ NE $\frac{1}{4}$		
	7.50	11	SW $\frac{1}{4}$ NE $\frac{1}{4}$		
	10.00	11	NE $\frac{1}{4}$ SE $\frac{1}{4}$		
	10.00	11	NW $\frac{1}{4}$ SE $\frac{1}{4}$		
	27.525	11	SE $\frac{1}{4}$ SE $\frac{1}{4}$		
	126.00	11		16	67
	13.00	13	NW $\frac{1}{4}$ NW $\frac{1}{4}$		
	5.00	13	NE $\frac{1}{4}$ NW $\frac{1}{4}$		
	20.00	13	SW $\frac{1}{4}$ NW $\frac{1}{4}$		
	15.00	13	SE $\frac{1}{4}$ NW $\frac{1}{4}$		
	4.50	13	SW $\frac{1}{4}$ NE $\frac{1}{4}$		
	7.50	13	SE $\frac{1}{4}$ NE $\frac{1}{4}$		
	24.50	13	NW $\frac{1}{4}$ SE $\frac{1}{4}$		
	32.75	13	NE $\frac{1}{4}$ SE $\frac{1}{4}$		
	26.40	13	SE $\frac{1}{4}$ SE $\frac{1}{4}$		
	31.85	13	SW $\frac{1}{4}$ SE $\frac{1}{4}$		
	24.50	13	NE $\frac{1}{4}$ SW $\frac{1}{4}$		
	12.00	13	SE $\frac{1}{4}$ SW $\frac{1}{4}$		
	216.50	13		16	67
	7.50	14	NE $\frac{1}{4}$ NE $\frac{1}{4}$	16	67
	5.00	18	SW $\frac{1}{4}$ SW $\frac{1}{4}$	16	68
	3.00	19	SW $\frac{1}{4}$ SE $\frac{1}{4}$		
	6.00	19	NE $\frac{1}{4}$ SW $\frac{1}{4}$		
	5.00	19	SE $\frac{1}{4}$ SW $\frac{1}{4}$		
	14.00	19		16	68
	3.00	24	NW $\frac{1}{4}$ NE $\frac{1}{4}$		
	20.00	24	NE $\frac{1}{4}$ NE $\frac{1}{4}$		
	5.00	24	SW $\frac{1}{4}$ NE $\frac{1}{4}$		
	4.00	24	SE $\frac{1}{4}$ NE $\frac{1}{4}$		
	32.00	24		16	67
	3.00	30	NW $\frac{1}{4}$ NE $\frac{1}{4}$	16	68
Total.....	466.00				

466/70 c.f.s. allowed for irrigation.

Appropriator—Muddy Valley Irrigation Co.

Source—Muddy River.

<i>Ditch Title</i>	<i>Date when construction commenced</i>	<i>Date when land first irrigated</i>	<i>Number of acres irrigated</i>	<i>Sec.</i>	<i>Subdivision</i>	<i>Tp.</i>	<i>S</i>	<i>R.</i>	<i>E.</i>
Kaolin Ditch.....			28.00	19	SE½SE¼	16		68	
			20.00	30	SW¼NE¼				
			20.00	30	NW¼SE¼				
			7.00	30	NE¼NE¼				
			47.00	30		16		68	
			20.00	32	NE¼SE¼				
			20.00	32	NW¼SE¼				
			40.00	32		16		68	
			4.00	29	NE¼NW¼	16		68	
Total			119.00						

119/70 c.f.s. allowed for irrigation.

Appropriator—Muddy Valley Irrigation Co.

Source—Muddy River.

St. Thomas Ditch.....	15.00	10	SE¼NW¼						
	20.05	10	NW¼NE¼						
	19.00	10	NE¼NE¼						
	23.00	10	SW¼NE¼						
	13.50	10	SE¼NE¼						
	17.25	10	NE¼SE¼						
	2.50	10	SE¼SE¼						
	110.30	10				17		68	
	5.00	11	NW¼NW¼						
	28.00	11	SW¼NW¼						
	30.25	11	NW¼SW¼						
	20.25	11	NE¼SW¼						
	34.00	11	SW¼SW¼						
	37.75	11	SE¼SW¼						
	20.80	11	SW¼SE¼						
	176.05	11				17		68	
	17.80	14	NW¼NW¼						
	37.00	14	NE¼NW¼						
	25.20	14	NW¼NE¼						
	24.20	14	NE¼NE¼						
	10.50	14	SW¼NE¼						
	19.40	14	SE¼NE¼						
	134.10	14				17		68	
Total	420.45								

42045/7000 c.f.s. allowed for irrigation.

Appropriator—Muddy Valley Irrigation Co.

Source—Muddy River.

East St. Thomas Ditch.....	4.00	2	SW¼SW¼	17	68				
	17.00	3	SE¼SE¼						
	7.00	3	NE¼SE¼						
	24.00	3		17	68				
	15.85	11	NW¼NW¼						
	16.10	11	NE¼NW¼						
	8.00	11	SW¼NW¼						
	12.00	11	SE¼NW¼						
	10.60	11	NW¼SE¼						
	62.55	11		17	68				
Total	90.55								

Domestic use allowed from all Muddy Valley Irrigation Company Ditches.

9055/7000 c.f.s. allowed for irrigation.

Appropriator—John F. Perkins.

Source—Muddy River.

<i>Ditch Title</i>	<i>Date when construction commenced</i>	<i>Date when land first irrigated</i>	<i>Number of acres irrigated</i>	<i>Sec.</i>	<i>Subdivision</i>	<i>Tp.S. R.E.</i>
St. Thomas Ditch.....			2.00	10	E part of NE $\frac{1}{4}$ SE $\frac{1}{4}$	
				11	W part of NW $\frac{1}{4}$ SW $\frac{1}{4}$	17 68
Domestic use allowed.						
2/70 c.f.s. allowed for irrigation.						

Appropriator—Muddy Valley Irrigation Co., Assignee of Nevada Land and Livestock Co., Under Certificate No. 58.

Source—Muddy River.

Overton Canal.....	20.00	2	W $\frac{1}{2}$			
	5.00	2	NW $\frac{1}{4}$ NW $\frac{1}{4}$			
			SW $\frac{1}{4}$ SE $\frac{1}{4}$			
	115.00	11	and SE $\frac{1}{4}$ SE $\frac{1}{4}$			
	40.00	12	NE $\frac{1}{4}$ NE $\frac{1}{4}$			
	25.00	12	and SE $\frac{1}{4}$			
	40.00	13	W $\frac{1}{2}$ SW $\frac{1}{4}$			
	6.50	13	E $\frac{1}{2}$ SW $\frac{1}{4}$			
	25.36	13	NW $\frac{1}{4}$ NW $\frac{1}{4}$			
	7.09	13	NW $\frac{1}{4}$ SW $\frac{1}{4}$			
	16.00	14	NW $\frac{1}{4}$ SE $\frac{1}{4}$			
			NE $\frac{1}{4}$ NE $\frac{1}{4}$		16	67
	27.36	19	SW $\frac{1}{4}$			
	34.00	30	SW $\frac{1}{4}$ NE $\frac{1}{4}$			
	20.00	30	N $\frac{1}{2}$ SE $\frac{1}{4}$			
	16.80	30	SE $\frac{1}{4}$ SE $\frac{1}{4}$		16	68
Total.....	398.11					
3.98 c.f.s. allowed for irrigation.						

The use of this water is determined as a winter use; diversion to commence October 1 of each year and to extend to April 1 of the year following. The use is limited to irrigation, stockwatering, and domestic purposes.

Appropriator—Muddy Valley Irrigation Co., Assignee of Nevada Land and Livestock Co., Under Certificate No. 59.

Source—Muddy River.

WINTER USE						
Kaolin Ditch.....	40.00	20	SW $\frac{1}{4}$ SW $\frac{1}{4}$		16	68
	150.00	29	SW $\frac{1}{4}$		16	68
	310.00	32	N $\frac{1}{2}$		16	68
	35.20	32	N $\frac{1}{2}$ SW $\frac{1}{4}$		16	68
	111.61	32	SE $\frac{1}{4}$		16	68
	70.00	33	S $\frac{1}{2}$ SW $\frac{1}{4}$		16	68
	36.36	33	NW $\frac{1}{4}$ SW $\frac{1}{4}$		16	68
	24.48	31	E $\frac{1}{2}$ NE $\frac{1}{4}$		16	68
	52.70	3	W $\frac{1}{2}$ SW $\frac{1}{4}$		17	68
		4	SE $\frac{1}{4}$		17	68
	16.35	4	NE $\frac{1}{4}$ NW $\frac{1}{4}$		17	68
SUMMER USE						
	140.00	29	SW $\frac{1}{4}$		16	68
	250.00	32	N $\frac{1}{2}$		16	68
	35.20	32	N $\frac{1}{2}$ SW $\frac{1}{4}$		16	68
Total summer use.....	425.20					
Total winter use.....	846.65					
Summer use—4.252 c.f.s.						
Winter use—8.466 c.f.s.						

The use is limited to irrigation, stockwatering, and domestic purposes.

Appropriator—**Muddy Valley Irrigation Co., Assignee of Nevada
Land and Livestock Co., Under Certificate No. 60.**

Source—**Muddy River.**

<i>Ditch Title</i>	<i>Date when construction commenced</i>	<i>Date when land first irrigated</i>	<i>Number of acres irrigated</i>	<i>Sec.</i>	<i>Subdivision</i>	<i>Tp.S. R.E.</i>
St. Joe or Logan Ditch.....			20.00	26	SE $\frac{1}{4}$ SW $\frac{1}{4}$	
			20.00	35	E $\frac{1}{4}$ NE $\frac{1}{4}$	
			40.00	35	SE $\frac{1}{4}$ NW $\frac{1}{4}$	15 67
Total			80.00			

The use of this water is determined as a winter use; diversion to commence October 1 of each year, and to extend to April 1 of the year following. Use limited to irrigation, stock-watering and domestic purposes.

0.8 c.f.s. allowed for irrigation.

STATE OF NEVADA STATE ENGINEER'S OFFICE

I, J. G. Scrugham, State Engineer of the State of Nevada, duly appointed and qualified, having charge of the records and files of the office of the State Engineer, do hereby certify that the foregoing is a full, complete and true copy of the Order of Determination of the Relative Rights in and to the Waters of Muddy River and its Tributaries in Clark County, Nevada, prepared and filed in said office on the 21st day of January, 1920, as appears by the records and files of the office of the State Engineer of Nevada, and nothing more or less.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my seal of office at the City of Carson, State of Nevada, this 21st day of January, A. D. 1920.

[SEAL]

J. G. SCRUGHAM,
State Engineer.





STATE OF NEVADA

ANNUAL REPORT

OF THE

STATE SHEEP COMMISSION

1919

S. H. WHEELER, President
G. D. WOLFENSPARGER, Secretary



CARSON CITY, NEVADA
STATE PRINTING OFFICE : : : JOE FARNSWORTH, SUPERINTENDENT
1920



REPORT FOR THE YEAR 1919

RENO, NEVADA, November 30, 1919.

To His Excellency, HON. EMMET D. BOYLE, Governor of the State of Nevada, Carson City, Nevada.

DEAR SIR: I herewith submit to you the thirteenth annual report of the Nevada State Sheep Commission for the fiscal year ending November 30, 1919:

Beginning the fiscal year 1919, we had a serious situation relative to scabies along the Nevada, California, Idaho, and Utah border. There was no law under which we could compel the dipping of sheep that might have been exposed; the only action we could get was where scabies actually existed and where the owner of the sheep was willing to dip; for the past three years there had been a spread of scabies in Lassen and Modoc Counties, Calif., with very little effort on the part of the authorities to control or eradicate the disease. The sheep would come in contact with infected herds in California and cross into Nevada without being dipped and develop scabies after they had entered this State. The sheep from Idaho and Utah have heretofore entered Nevada without restrictions or control relative to health.

The 1st of December, 1918, there was known to be 6,000 scabby foreign sheep in Washoe County, and it was known also that many thousands more had been or would be exposed and develop the disease before the spread could be checked.

The last Legislature amended and enlarged the law of 1907 providing whereby imported sheep could be dipped at time of entry, as well as provisions whereby exposed sheep within the State could be dipped. So far this law, approved March 25, 1919, has been generally respected by sheep-owners within the State and by importers of sheep from all sections of the country with the exception of Idaho and Utah. The board expects this new law to be contested by some of the Idaho sheep-owners, and if it is sustained by the courts we expect very little trouble in the future from imported sheep.

INSPECTION REPORT**November 30, 1918, to November 30, 1919**

Number of sheep inspected during the fiscal year.....	1,004,402
First dippings, account of disease or exposure thereto.....	356,663
Second dippings of diseased sheep.....	58,921
Dipping of sheep for ticks.....	55,389
Dipping of rams in compliance with annual dipping law.....	15,751
Dipped in Idaho, in compliance with the Governor's Quarantine Proclamation, to enter Nevada summer ranges.....	61,561
Sheep dipped on account of scabby sheep brought in from Idaho.....	15,152
Nevada sheep dipped on account of above.....	50,114
Sheep dipped on account of California scabies.....	167,578
Infected sheep dipped solely on account of Nevada scabies.....	23,654

The per cent of sheep infected with scabies remaining in the State from previous years was approximately 1.5%, a reduction of 1% over the year 1918; of this 1.5%, with the exception of about 600 sheep on ranches, all the infection was confined to three outfits.

The large number of infected sheep reported along the Nevada-California border is due to the fact that a number of herds which became infected in California were brought into vats along the line for the purpose of dipping.

The number of visits to herds reported by State Inspectors totals 1,334. This number does not include trips to talk to owners regarding their sheep. To include such trips would make a total of 2,000 visits, all of which are necessary in work of this description to the tracing of the origin of disease, movement of diseased and exposed sheep, and for the arranging of quarantine and treatment.

At the close of the fiscal year, November 30, 1919, there was not a sheep within the State of Nevada that was known to be diseased or a sheep known to have been exposed. In other words, there was not a single sheep known in the State of Nevada that we could conscientiously ask the owner to dip; but we recognize the fact that where there has been so many scabby and exposed sheep there is always strays from these herds that are not dipped, and some of these strays are apt to get back in some herd and cause infection. At the present time it looks as though Nevada is in splendid shape, and very little, if any, scab is anticipated, through the central part of the State. It is reasonable to believe that during the coming year there will be at least a 75% reduction in the number of scabby sheep along the Nevada-California border over that of 1919.

If the present law is sustained by the courts it is reasonable to expect that the disease of scabies will be completely eradicated from Nevada flocks within a comparatively short time.

As in the past, the Bureau of Animal Industry, United States Department of Agriculture, has extended a hearty cooperation in this work for which due acknowledgment is hereby made.

The rate of taxation for the tax year 1919 was placed at 3 mills (.003) on the dollar of the assessed valuation of all sheep, bucks and goats in the State of Nevada, as reported by the several County Assessors.

ASSESSED VALUATION OF SHEEP, BUCKS, AND GOATS
As Shown by the County Assessors' Reports to the Commission and in Effect
for the Tax Year of 1919

<i>Counties</i>	<i>Sheep</i>	<i>Bucks</i>	<i>Goats</i>	<i>Valuation</i>
Washoe.....	158,988	2,921	.....	\$1,465,944.00
Lyon.....	54,422	354	19	495,403.00
Churchill.....	27,777	511	80	256,845.00
Ormsby.....	3,770	35	.....	34,350.00
Nye.....	38,842	303	242	350,382.00
Esmeralda.....	113	2	100	1,339.00
White Pine.....	114,939	1,622	50	1,054,365.00
Pershing.....	17,646	426	.....	163,926.00
Lander.....	63,720	87	.....	547,524.00
Mineral.....	29,460	300	.....	268,740.00
Elko.....	246,045	2,873	7	2,348,944.00
Humboldt.....	147,566	2,125	9	1,353,675.00
Storey.....	10	.....	.....	90.00
Douglas.....	31,501	289	.....	286,977.00
Clark.....	813	.....	.....	7,317.00
Lincoln.....	25,805	50	.....	232,625.00
Eureka.....	39,730	720	.....	366,210.00
Totals.....	1,001,147	12,618	507	\$9,240,056.00

REPORT OF STATE SHEEP COMMISSION

FINANCIAL STATEMENT

For the Year Ending November 30, 1919

Receipts

Cash on hand November 30, 1918.....	\$10,484.50
Bonds with State Treasurer.....	20,000.00
<i>Tax Collections—</i>	
Churchill County.....	\$495.15
Douglas County.....	774.26
Elko County.....	4,505.42
Eureka County.....	801.90
Humboldt County.....	3,127.94
Lander County.....	1,029.69
Lincoln County.....	388.83
Lyon County.....	725.61
Mineral County.....	479.10
Nye County.....	1,622.59
Ormsby County.....	23.18
Washoe County.....	3,025.89
White Pine County.....	2,168.36
Esmeralda County.....	1.44
	<hr/>
	19,171.36
Interest from bonds.....	\$404.00
Interest from bonds.....	425.00
	<hr/>
	829.00
Victory notes.....	5,000.00
	<hr/>
	\$55,484.86

Disbursements

Commissioners' salaries.....	\$1,499.76
Commissioners' expenses, travelling.....	30.56
Salary of Secretary.....	750.00
Office rent.....	225.45
Auto insurance.....	22.75
Legal services.....	150.00
Office furniture.....	88.60
Advertising in state papers.....	179.60
Laboratory work.....	166.67
Office postage, stationery, printing, express, tele- phone and telegraphic charges.....	154.88
Inspectors' salaries.....	9,730.00
Inspectors' traveling expenses.....	5,154.94
	<hr/>
	\$18,153.21
Purchase of Victory notes.....	\$5,000.00
Interest on moneys advanced for purchase of Liberty bonds and Victory notes.....	30.69
	<hr/>
	5,030.69
Cash on hand with State Treasurer, November 30, 1919.....	7,300.96
Bonds and notes with State Treasurer.....	25,000.00
	<hr/>
	\$55,484.86
Current bills payable, \$2,787.50.	

CONDENSED FINANCIAL STATEMENT

1907 to 1919, Inclusive

<i>Receipts</i>		<i>Expenditures</i>	
1907.....	None	1907.....	\$3,155.30
1908.....	\$7,108.85	1908.....	11,840.82
1909.....	11,124.04	1909.....	11,813.14
1910.....	15,288.63	1910.....	8,882.66
1911.....	15,256.21	1911.....	8,053.34
1912.....	25,522.81	1912.....	8,790.24
1913.....	8,260.32	1913.....	11,119.10
1914.....	6,016.17	1914.....	14,044.86
1915.....	5,728.57	1915.....	13,573.91
1916.....	28,526.27	1916.....	23,247.54
1917.....	21,978.46	1917.....	17,381.11
1918.....	37,082.77	1918.....	19,506.58
1918, Liberty bonds.....	20,000.00	1918, Liberty bonds.....	20,000.00
1919.....	20,000.36	1919.....	18,183.90
1919, Victory notes.....	5,000.00	1919, Victory notes.....	5,000.00
Cash on hand with State Treasurer, November 30, 1919.....			7,300.96
Liberty bonds and Victory notes, November 30, 1919.....			25,000.00
	<hr/>		<hr/>
	\$226,953.46		\$226,953.46

Respectfully submitted,

S. H. WHEELER,

President.

Approved: C. W. GRISWOLD,

J. G. TAYLOR,

*Commissioners.*Attest: G. DEL WOLFENSPARGER, *Secretary.*



AGRICULTURAL EXPERIMENT STATION
THE UNIVERSITY OF NEVADA

Bulletin No. 98

January, 1920

ARROW-GRASS
A New Stock-Poisoning Plant
(*Triglochin maritima*)

By

C. E. FLEMING and N. F. PETERSON
Of the Department of Range Management

Assisted by

M. R. MILLER
Of the Department of Chemistry
and

Dr. L. H. WRIGHT and Dr. R. C. LOUCK
Of the Department of Veterinary Science

PUBLISHED BY THE UNIVERSITY OF NEVADA
RENO, NEVADA



CARSON CITY, NEVADA

STATE PRINTING OFFICE : : JOE FARNSWORTH, SUPERINTENDENT

1920

NEVADA AGRICULTURAL EXPERIMENT STATION

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HON. WALTER E. PRATT (1925)	Reno
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M. R. MILLER, B.S.	Chemist
HESTER MAYOTTE	.	.	.	Librarian and Secretary to Director	

ACKNOWLEDGMENT

The Nevada Agricultural Experiment Station takes pleasure in thanking A. O. Larson of Castle Dale, Utah, for suggestions which led to the study of the poisonous properties of Arrow-Grass, and to Mr. G. W. Walts of Reno, Nevada, for valuable information and assistance.

ANNOUNCEMENT

In July, 1918, the Nevada Agricultural Experiment Station published Bulletin No. 95 entitled "Range Plants Poisonous to Sheep and Cattle in Nevada," by C. E. Fleming, head of the Department of Range Management. Hundreds of requests for copies were received from stockmen and forest rangers in Nevada and California. The Foreign Press Bureau of the Committee on Public Information requested 500 copies for distribution in South American countries. Although the number printed was unusually large, the entire edition of this bulletin was soon exhausted and republication has become desirable.

Since the publication of Bulletin No. 95 long series of feeding experiments with poisonous plants have been made at the Nevada Station. Before publishing another general bulletin on the subject of range plants poisonous to sheep and cattle it seems best to print a short series of bulletins giving the results of feeding tests made with each poisonous plant.

We plan later to bring together the results of all the new experiments with all former information on the subject in another illustrated general bulletin on poisonous plants.

S. B. DOTEN,
Director.

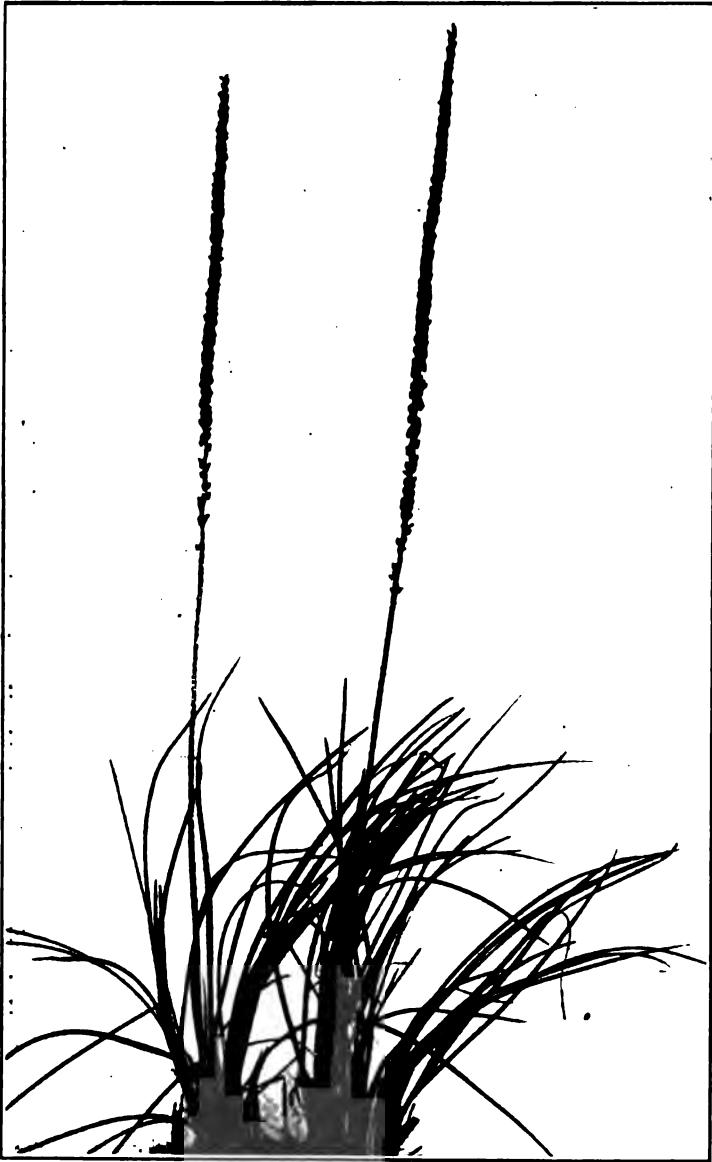


Figure 1. Typical plant of Arrow-Grass, showing cluster of leaves and two flower stalks.



Figure 2. Arrow-Grass, growing among other plants and grasses.

SUMMARY

1. Recent experiments conducted by the Agricultural Experiment Station of the University of Nevada show that under certain conditions the grasslike plant commonly known as Arrow-Grass is poisonous to both sheep and cattle.

2. Arrow-Grass looks like the common grasses; and often grows among them in wet soils especially where the ground contains alkali.

3. Figures 1, 2 and 3 of this bulletin give a good idea of the general appearance of the plant.

4. Arrow-grass contains an unknown substance, which is sometimes broken up in the stomach of the animal, liberating a deadly poison—hydrocyanic (“prussic”) acid gas.

5. Animals fatally poisoned by Arrow-Grass breathe very rapidly at first; they tremble, breathe through the mouth, walk around stiffly, have spasms and go down in convulsions. Later they breathe more slowly and with increasing difficulty, spasms continuing at intervals until death, which occurs in from half an hour to three hours.

6. An animal must eat a large dose at one time in order to be poisoned. Small doses eaten at frequent intervals or moderate quantities eaten daily have no harmful effects.

7. Arrow-Grass cut and dried in hay is far more dangerous and deadly than the green plant.

8. When the body of an animal dead of Arrow-Grass poisoning is cut up there is little indication of the cause of death. There is usually some congestion of the lungs and of the fourth stomach, but neither condition is characteristic of this plant alone.

9. Because of the nature of the poison and because death follows poisoning so promptly, there is little hope of finding methods of treating and curing animals seriously poisoned by Arrow-Grass.

10. Places where Arrow-Grass grows very thickly should be fenced off. Considerable effort should be made to prevent Arrow-Grass from being cut, dried and put up in hay.

ARROW-GRASS

A New Stock-Poisoning Plant

(*Triglochin maritima*)

IN THE AUTUMN OF 1918 we were informed by A. O. Larson of Castle Dale, Utah, that cattle had died in southern Utah from eating a plant known in that region as "goose-grass." Fatal poisoning had been caused by the green plants in pastures and more especially by the dried plant in hay. Specimens sent by Mr. Larson to the Nevada Station were identified as "arrow-grass" or "sour-grass" (*Triglochin maritima*). The small amount of material sent from Utah was insufficient to produce any symptoms of poisoning in sheep; however, as this plant is common in wet and semialkaline places in the vicinity of Reno, experimental feedings of larger amounts were begun at once and continued throughout the spring and summer of 1919. These feeding tests showed clearly that under certain conditions the plant is poisonous to both sheep and cattle. The results of these tests are given in detail in this bulletin.

Common Names.

Triglochin is known by three common names — arrow-grass, goose-grass, and sour-grass. Because arrow-grass is the name most commonly and universally used, its adoption and use by stockmen is recommended.

Description of Plant.

This poisonous plant belongs to a little family of plants known as the arrow-grass family. It grows in bright-green clumps and bunches, so much like grass that it is hard to find in the midst of grasses and other plants until the flower heads and pods have formed. It grows in scattered clumps about 12 inches wide, or in irregular patches which may be from 10 to 20 feet or more across. The flat clumps or bunches of arrow-grass grow from 6 to 12 inches high; and each clump of leaves bears a straight slender flower-stalk, growing to



Figure 3. In grass meadows it is hard to find Arrow-Grass before it blooms.

a height of from 12 to 30 inches. The flowers and seed-pods form a slender cluster from 6 to 12 inches long. The flowers themselves are tiny greenish things, and are soon followed by the oblong three-sided seed-pods.

The leaf of arrow-grass is slender, bright-green, very much like grass or sedge. Still it may readily be told from grass by the fact that it is



Figure 4. Cross-section of Arrow-Grass leaf, greatly magnified. (X20). The leaf of Arrow-Grass is thick and spongy, not thin and flat like that of ordinary grasses.

not flat like a grass-blade, but is thick and spongy, flat on one side and round on the other. The leaf of arrow-grass is soft, not wiry and tough like that of a sedge. The leaves are attached to an underground stem, about as thick as a lead-pencil, which pushes its way along beneath the surface, sending up leaves and sending down numerous fibrous roots. The general appearance of the plant is shown in Figures 1, 2 and 3. A flower cluster and a cluster of seed-pods are shown in Figures 5 and 6.

Distribution.

Arrow-grass is widely distributed over the northern half of the world. In North America it is found from New Jersey to California and from Labrador to Alaska. On the sea coast it grows in salt marshes; inland it may be found in wet alkaline soils and along the edges of sloughs, associated with grasses and sedges and other plants which require much water.

Three species of arrow-grass occur throughout North America in wet saline or semialkaline soils. At least two of them occur in the pastures and meadows in Nevada, but *Triglochin maritima* being the larger plant and the most common is probably the one responsible for most of the stock losses that occur from eating this plant. It is not definitely known if the other species are sufficiently abundant and poisonous to be dangerous.

Losses Due to Arrow-Grass.

But little is known concerning the extent of animal losses caused by arrow-grass. It has not been generally considered poisonous, and many losses attributed to other causes may have been due to this plant. Dried arrow-grass mixed with hay or fed free from mixture is readily eaten. The green plant does not seem to be distasteful to animals, and it is sometimes eaten greedily, although many other poisonous plants, especially those containing alkaloids, are so bitter that stock will eat them only when forced to do so by extreme hunger.

Because of its rather pleasing and acceptable taste and because of the fact that the plant often grows in almost pure patches from a few feet to rods across and produces a large quantity of forage, it would seem easier for animals either on pasture or on hay to get a fatal dose of arrow-grass than of poisonous plants which grow scattered here and there amid other foliage.

The Poisonous Principle of Arrow-Grass.

An air-dried sample of the plant (*Triglochin maritima*) used in the feeding experiments was examined in the Station Laboratory and was

found to possess cyanogenetic properties, i. e., would yield hydrocyanic acid ("prussic" acid) upon suitable treatment.

That this might be expected was, in a measure, suggested by the symptoms observed in the feeding experiments. In the literature it appears that Greshoff¹ found from 0.02% to 0.6% of hydrocyanic acid



Figure 5. Flowers of Arrow-Grass magnified (X2). Flower is small, greenish, and insignificant.



Figure 6. Seed-pods of Arrow-Grass magnified (X2).

in *Triglochin maritima*. Later Blanksma² in working with the same plant found hydrocyanic acid in amounts varying from 0.056% to 0.184%.

¹Greshoff, M.: A New Natural Group of Plants Containing Hydrocyanic Acid. Pharm. Weekblad, 45. 1165-69, 1907.

²Blanksma, J. J.: Hydrocyanic Acid in Sour-Grass (Triglochin). Pharm. Weekblad, 50. 1295-1302.

In the plants known as cyanogenetic plants, substances have been found in which hydrocyanic acid is in combination with other compounds. As an example of such compounds may be cited amygdalin, a compound, which will yield hydrocyanic acid and benzaldehyde, found in the bitter almond. Compounds of this sort may be made to give up their hydrocyanic acid by the action of suitable reagents, such as by the action of acids upon amygdalin. Another method of breaking off the hydrocyanic acid is by the action of certain ferments. Almost invariably the cyanogenetic substance is found to be accompanied in the plant by a ferment most suitable for that substance. When the cells of the plant are broken the ferment has opportunity to act upon the hydrocyanic acid-holding compound and the acid is liberated.

The poisonous properties of the cyanogenetic plants may be reasonably thought to be due to hydrocyanic acid liberated as described above. That other poisons are present may be possible and has been suggested, but laboratory examination has failed to disclose the presence of notable amounts of other poisonous substances such as alkaloids or saponins.

In the sample submitted, which had lost 79.2% of moisture in drying, there was found 0.264% hydrocyanic acid. Calculated to the original green weight of the plant, this is equivalent to 0.0549% hydrocyanic acid in the original plant. That there is a possibility that a part of the hydrocyanic acid originally present in the green plant was lost in drying, has been shown to be the case in the drying of sorghums. This would make the above figure lower than it should be for the green plant. Dowell³ showed that in the drying of sorghum approximately three-fourths of the acid is set free.

Laboratory evidence in this case shows that we have been dealing with a cyanogenetic substance, the nature of which will form the subject of a more technical paper from this Station in the future.

Poisonous plants of this type sometimes appear to have an erratic action both in feeding experiments and also when animals are grazing at will. Apparently the grazing of sheep and cattle upon such plants has not been accompanied with fatal results in every case. The areas from which the samples used in these experiments were obtained have been and are used for the grazing of sheep with the only results that at times lambs succumb. Cattle have been fed safely upon sorghums which unquestionably contained hydrocyanic acid and which at other times and under different conditions of feeding caused fatal results. The leaves of the choke-cherry contain hydrocyanic-producing substances, but poisoning does not necessarily accompany natural feeding, although fatal results have been reported. Linseed cake has been the subject of many experiments,⁴ and has been found to contain lethal doses of hydrocyanic acid in the amounts fed, but still was successfully used in feeding and fattening.

In explaining such a state of affairs it is necessary to consider all of the possible factors which contribute to the action of these compounds. Auld⁴ has pointed out that under digestive conditions cyanogenesis is likely to be inhibited. He shows that the presence of acids, alkalies, salts, cellulose and glucose all tend to prevent the liberation of the

³Dowell, C. T.: Cyanogenesis in *Andropogon Sorghum*. *J. Agr. Res.* (1919) 16, 17, 175-81.

⁴Auld, S. J. M.: Cyanogenesis under Digestive Conditions. *Jour. Agr. Sci.* (1913) 5 408-33.

poison, and that in the cases of feeding in which poisoning occurs it is likely that there is some element which interferes with the inhibition which would normally take place. The possibility of the formation of hydrocyanic acid in the food before feeding is very likely in cases in which the feeding stuff is manipulated or prepared before administration. In the case of green food, only the rupturing of the cells is sufficient to produce the free poison, and in the case of the dry material, which is generally more or less broken up, it is only necessary to introduce moisture to produce the free poison. If inhibition can be due to an alkaline medium, the normal conditions in the mouth during eating and in the rumen of the animal would have a protective action and would tend to prevent poisoning. Anything interfering with normal mastication and the attendant mixing of saliva with the food would evidently interfere with the inhibitory process and end with disastrous results. Auld (*loc. cit.*) points out the protective effect of cellulose and glucose, and that these carbohydrates have an inhibitory action on the evolution of hydrocyanic acid has been observed by other investigators with other plant materials. In fact, it has been recommended^b that glucose be used as an antidote in cases of poisoning from this source. As a matter of fact, it is probable that the administration of glucose would have but little effect if done after the symptoms of acute poisoning have developed. However, if a suspicious food was to be fed, it might be mixed with a glucose-containing material as a precautionary measure.

Another and equally important factor is that of the physical condition of the animal when fed; the state of its health and whether the food in question is taken upon a partially filled or empty stomach. It would appear in the case of sorghum, for example, that cows turned into sorghum would be fatally poisoned if nothing had been eaten for a short time previously; but if they were first fed and then allowed access to the same plants no poisoning would follow.

The Season of the Year when Arrow-Grass Is Poisonous.

Feedings were made with arrow-grass cut both in early summer and during fall. It appeared equally poisonous at both seasons. There is good reason for believing that the plant is toxic during the entire period of its growth.

The Part of the Plant which Is Poisonous.

The greater part of arrow-grass consists of the leaves, the flower stalk making only a small portion of its total weight. The leaves have been conclusively proven to be poisonous. We have not found out whether the flower stalks are poisonous because they are more or less tough and unpalatable and make up only a minor part of the total weight of the plant. The roots are so firmly held down by their fibrous growth that there is little or no chance of their being eaten.

The following tables give the feeding tests which were made with sheep and cattle in the fall of 1918 and the spring and summer of 1919; all the animals were fed the fresh green leaves except a single sheep weighing seventy pounds which was fed three-fourths of a pound of the green fruits without results:

^bPeters, A. F., Slade, H. B., and Avery, Samuel: Poisoning of Cattle by Common Sorghum and Kafir Corn. Nebraska Station Bulletin No. 77.

SHEEP-FEEDING TESTS WITH GREEN MATERIAL, 1918-1919

Animal No.	Weight of animal	Date	Time fed	Amount fed	Time symptoms appeared	Time of death or recovery	Final result
42.....	70 lbs.	10-7-1918	4:40 p. m.	$\frac{1}{2}$ lb.	None		
40.....	100 lbs.	10-7-1918	4:30 p. m.	1 lb.	None		
39.....	97 lbs.	10-8-1918	3:10 p. m.	$4\frac{1}{2}$ lbs.	3:25 p. m.	4:13 p. m.	Death
42.....	75 lbs.	10-10-1918	4 p. m.	2 lbs.			Slightly sick
		10-15-1918	11:40 a. m.	2 lbs.	12:05 p. m.	1:40 p. m.	Death
46.....	72 lbs.	10-29-1918	2:30 p. m.	3 lbs.	None		
	75 lbs.	11-7-1918	9 a. m.	$2\frac{1}{2}$ lbs.	None		
26.....	75 lbs.	4-12-1919	9 a. m.	1 lb.	None		
29.....	81 lbs.	4-15-1919	9:30 a. m.	1 lb.	None		
26.....	75 lbs.	4-15-1919	9:40 a. m.	$1\frac{1}{2}$ lbs.	None		
	73 lbs.	6-3-1919	11:40 a. m.	1 lb.	12:50 a. m.	1:15 p. m.	Death
46.....	70 lbs.	6-8-1919	1:15 p. m.	1 lb.	None		
		6-4-1919	10:50 a. m.	$1\frac{1}{2}$ lbs.	None		
		6-5-1919	10 a. m.	$1\frac{1}{2}$ lbs.	None		
		6-6-1919	10 a. m.	2 lbs.	None		
		6-7-1919	2 p. m.	$2\frac{1}{2}$ lbs.	None		
		6-11-1919	2 to 4 p. m.	$2\frac{1}{2}$ lbs.	4:30 p. m.	7 p. m.	Recovery
		6-12-1919	9:20 a. m.	$2\frac{1}{2}$ lbs.	9:30 a. m.	9:55 a. m.	Death
29.....	80 lbs.	6-11-1919	9 to 10:20 a. m.	$1\frac{1}{2}$ lbs.	10:30 a. m.	10:55 a. m.	Death

As a result of the twenty feeding tests, 7 sheep were poisoned, 5 of which died. The weight of green material required to make a sheep sick or to kill it varied from $1\frac{1}{2}$ pounds to $4\frac{1}{2}$ pounds, the average fatal dose being approximately 2.4 pounds. Because of the extremely irregular way in which plants containing hydrocyanic acid act on animals, it would be difficult to state accurately just how much of the plant is required to kill a sheep or to make it sick.

However, the above tests demonstrate conclusively that arrow-grass is a plant containing an active poison, and, although the amounts necessary to produce sickness or death may seem high, in reality they are not; for the plant is made up of a rather open cellular structure containing a high percentage of water. Further, when poisoning does take place death is likely to follow; this is shown by the fact that of 7 animals poisoned 5 died. Four of the deaths were caused by $2\frac{1}{2}$ pounds or less of green material.

A series of feeding tests with cattle made in spring, summer and autumn with green arrow-grass failed to cause poisoning. The tests are summarized in the table at the top of page 13.

Two pounds of green arrow-grass had no effect on Steer No. 735. In October this animal ate an average of $15\frac{1}{2}$ pounds daily for 7 days or a total quantity of $110\frac{1}{2}$ pounds, with no bad effects. The material for this test as shown in the table was collected during October. The June feeding tests also resulted negatively.

These results cannot be taken to mean that fresh green arrow-grass is not poisonous to cattle; for we must constantly keep in mind the irregular and apparently inconsistent action of plants containing hydrocyanic acid. There is a possibility that under different conditions of feeding and at another time the feeding of the same quantity or even less would have caused poisoning. Many valuable forage plants in the sorghum group contain hydrocyanic acid; and yet they are ordinarily fed without causing losses. However, on the other hand, rather serious losses in cattle have been caused by the sorghums. With arrow-grass, the same erratic action may be expected. This test would seem to indicate that pastures where arrow-grass grows are ordinarily not dangerous to cattle; still, there is always a possibility that they may eat just the right amount at the right time with deadly results.

CATTLE-FEEDING TESTS WITH GREEN LEAVES, 1918-1919

Animal No.	Weight of animal	Date fed	Time fed	Amount fed
735.....	530 lbs.	10-10-1918	3 p. m.	2 lbs.
	515 lbs.	10-10-1918	4 p. m.	9½ lbs.
		10-12-1918	9 a. m.	11 lbs.
		10-15-1918	9 a. m.	19 lbs.
		10-22-1918	12 p. m.	20 lbs.
		10-23-1918	10 a. m.	14 lbs.
		10-26-1918	2 p. m.	23 lbs.
		10-27-1918	9 a. m.	
		10-27-1918	12 m.	10 lbs.
		10-27-1918	4 p. m.	4 lbs.
1.....	137 lbs.	4-15-1919	11:30 a. m.	1½ lbs.
		6-4-1919	10 a. m.	13½ lbs.
		6-5-1919	8:30 p. m.	8½ lbs.
			1 p. m.	
		6-6-1919	8 p. m.	6½ lbs.
			8 a. m.	
		6-7-1919	1 p. m.	2½ lbs.
		6-8-1919	3 p. m.	2½ lbs.
		6-8-1919	2 p. m.	4 lbs.
		6-10-1919	1 p. m.	8½ lbs.
7.....	141 lbs.	6-10-1919	5:30 p. m.	8½ lbs.
			10:30 p. m.	
		6-11-1919	8:30 a. m.	13½ lbs.
			5 p. m.	

Feeding Arrow-Grass in Hay.

The following feeding tests were made with sheep and cattle to determine the effect of various proportions of dry arrow-grass when put up in hay and fed. The plant material for these feedings was collected in 1919 on a ranch near Reno. One lot of 26½ pounds of fresh arrow-grass was collected June 3, 4 and 5 and air-dried to 5½ pounds. Another lot of 38½ pounds was collected on August 9 on the same ranch and air-dried to 9 pounds.

SHEEP-FEEDING TESTS WITH AIR-DRIED ARROW-GRASS

Animal No.	Weight of animal	Date fed	Time fed	Amount fed	Time symptoms appeared	Time of death or recovery	Final result
60.....	94 lbs.	8-5-1919	4 p. m.	8 ozs.	4:50 p. m.	5:50 p. m.	Death
37.....	83 lbs.	8-5-1919	4:20 p. m.				
			4:45 p. m.	12 ozs.	5:30 p. m.	Night	Recovery
56.....	101 lbs.	8-6-1919	10 a. m.				
			11:30 a. m.	4 ozs.	5:15 p. m.	9:30 p. m.	Recovery
53.....	109 lbs.	8-6-1919	10 a. m.				
			11:30 a. m.	4 ozs.			Negative
54.....	115 lbs.	8-6-1919	2:30 p. m.				
			3:30 p. m.	5½ ozs.	4 p. m.	4:35 p. m.	Death
58.....	100 lbs.	8-7-1919	1:30 p. m.				
			2:30 p. m.	4 ozs.	3:20 p. m.	7 p. m.	Recovery
51.....	96 lbs.	8-15-1919	3:30 p. m.	1 oz.			Negative
52.....	105 lbs.	8-15-1919	3 p. m.	1 oz.			Negative
58.....	100 lbs.	8-16-1919	8:50 a. m.	3 ozs.			Negative
51.....	96 lbs.	8-20-1919	6:50 a. m.	1 oz.			Negative
37.....	87 lbs.	8-20-1919	7 a. m.	2 ozs.			Negative
61.....	100 lbs.	8-20-1919	7:20 a. m.	3 ozs.	8:30 a. m.	10:15 a. m.	Death
62.....	82 lbs.	8-20-1919	7:30 a. m.	2½ ozs.	8:03 a. m.	9 a. m.	Death

TESTS WITH A YEARLING CALF

1.....	133 lbs.	8-8-1919	9:30 a. m.	7 ozs.	9:50 a. m.	10:20 a. m.	Death
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Thirteen feeding tests were made with the air-dried material fed to sheep, six of which tests either made the animal very sick or else caused death. These tests prove conclusively that small amounts of the dried plant are highly poisonous to sheep. The smallest amount which was fatal to a sheep was 2½ ozs., the average fatal dose being approximately

4.64 ozs. Again it is interesting to note the high percentage of deaths among the poisoned animals.

The one feeding test made with the yearling calf was so conclusive that it was considered unwise to sacrifice any more cattle. The small amount fed, only 7 ozs., readily produced typical poisoning symptoms, and its action was so characteristic and rapid that there appeared to be no immediate need of other tests with cattle.

The above feedings were made by uniformly mixing with alfalfa the small amounts of arrow-grass tabulated. Therefore, these tests show very clearly that there is considerable danger or risk of loss when arrow-grass is cut and put up with hay and fed to live stock.

SHEEP-FEEDING TESTS WITH SMALL AMOUNTS OF ARROW-GRASS IN HAY

Animal No.	Weight of animal	Date fed	Time fed	Amount fed
62.	82 lbs.	August 9	1:10 p. m.	1 oz.
			2:10 p. m.	1 oz.
			3:10 p. m.	1 oz.
			4:20 p. m.	1 oz.
			Total.....	4 ozs.
51.	94 lbs.	August 8	9:50 a. m.	1 oz.
			10:50 a. m.	1 oz.
			11:45 a. m.	1 oz.
			12:50 p. m.	1 oz.
			2:10 p. m.	1 oz.
			3:05 p. m.	1 oz.
			4:10 p. m.	1 oz.
			5:10 p. m.	1 oz.
			6:10 p. m.	1 oz.
			Total.....	5 oz.
51.	97 lbs.	August 21	10:30 a. m.	1 oz.
			11:30 a. m.	1 oz.
			1:20 p. m.	1 oz.
			2:30 p. m.	1 oz.
			3:30 p. m.	1 oz.
			4:30 p. m.	1 oz.
			7:00 a. m.	1 oz.
			8:10 p. m.	1 oz.
			9:00 p. m.	1 oz.
		August 22	12:10 a. m.	1 oz.
			7:00 a. m.	1 oz.
			8:00 a. m.	1 oz.
			9:00 a. m.	1 oz.
			10:00 a. m.	1 oz.
			11:00 a. m.	1 oz.
			12:00 m.	1 oz.
			12:50 p. m.	1 oz.
			1:45 p. m.	1 oz.
			2:30 p. m.	1 oz.
			3:15 p. m.	1 oz.
			4:00 p. m.	1 oz.
			4:45 p. m.	1 oz.
			5:30 p. m.	1 oz.
			6:10 p. m.	1 oz.
			7:00 p. m.	1 oz.
			7:45 p. m.	1 oz.
		August 23	8:30 p. m.	1 oz.
			6:40 a. m.	1 oz.
			7:20 a. m.	1 oz.
			8:00 a. m.	1 oz.
			8:40 a. m.	1 oz.
			9:20 a. m.	1 oz.
			10:00 a. m.	1 oz.
			10:40 a. m.	1 oz.
			12:00 m.	1 oz.
			1:00 p. m.	1 oz.
			1:30 p. m.	1 oz.
			2:00 p. m.	1 oz.
			2:30 p. m.	1 oz.
			3:00 p. m.	1 oz.
			3:30 p. m.	1 oz.
			4:00 p. m.	1 oz.
			4:30 p. m.	1 oz.
			4:50 p. m.	1 oz.
			5:10 p. m.	1 oz.

Feeding of Small Amounts at Stated Intervals Mixed with Hay.

The object of this series of feedings was to determine whether small amounts of air-dried arrow-grass (the total of which if fed at one time would cause sickness or death) would be harmful when fed a little at a time at various intervals. None of the animals were affected except No. 62, which showed symptoms of poisoning after the fourth 1-oz. dose.

The above feeding tests show that there is little or no cumulative effect of small doses fed at short intervals or over a long period of time. Previous to these tests a sheep had been fed 4 ozs. of air-dried arrow-grass which readily killed the animal. However, when 4 ozs. of similar material was fed in 1-oz. doses to a sheep at hourly intervals only sickness was produced. On August 8 at 9:50 a. m. a sheep was given $\frac{1}{2}$ oz. and thereafter $\frac{1}{2}$ -oz. feedings were made at approximately hourly intervals until 6:10 p. m. when 1 oz. was fed. In all between 9:50 a. m. and 6:10 p. m. 5 ozs. had been fed without producing any visible symptoms of poisoning.

On August 21 at 10:30 a. m. a prolonged feeding test was commenced and continued until 5:10 p. m., August 23, during which time 45 separate feedings were made of five 1-oz. feedings and forty $\frac{1}{2}$ -oz. feedings or a total of 25 ozs. with negative results.

From these feedings it appears that there is no cumulative action of the poisonous principle of arrow-grass when eaten in small amounts of less than 1 oz. at short intervals. It may therefore be safely concluded that an animal may eat many small amounts either in hay or on pasture with little danger. Thus, if small quantities of the dried material are uniformly scattered through the hay, there is not much to worry over, so far as the health of the animals is concerned. On the other hand, if there is any considerable quantity in the hay, fatal results may be expected especially if fine, broken material collects in the bottom of the feed racks. Dry arrow-grass is very brittle, easily broken, and may very readily sift to the bottom along with seeds, chaff, and other material. If this takes place, then there is a possibility of fatal poisoning, even though there is only a small amount of the plant in the hay.

DETAILED DESCRIPTION OF TYPICAL CASES OF ANIMAL POISONING

Case No. 1—No. 39.

A sheep weighing 97 pounds was fed $4\frac{1}{2}$ pounds of green arrow-grass leaves at 3:10 p. m. October 8, 1918. The animal appeared sick at 3:25 p. m. within fifteen minutes after feeding. Muscular spasms commenced at 3:30 p. m.; hindlegs pulled up under body; frequent champing of jaws, breathing hard and audible. At 3:40 the sheep was breathing through the mouth which was held wide open with the tongue hanging out; temperature, 102; respiration, 30. At 3:50 p. m. spasms continued; 3:55 p. m., respiration, 21; at 3:58 p. m., severe spasms commenced and breathing practically stopped; at 4:03 p. m., respiration 12, with long intervals between breaths. Expulsion of breath forcible and plainly audible; at 4:12 p. m. respiration had fallen to 8. Death occurred at 4:13 p. m.

Autopsy showed the jejunum severely congested; spleen dark and mushy; kidneys congested; lungs slightly congested; other organs all appeared normal.

Case No. 2—No. 42.

A ewe weighing 75 pounds was fed 2 pounds of green arrow-grass leaves at 11:40 a. m.; at 12:05 p. m. she was walking with a stiff peculiar gait the hindlegs far apart and held back. Soon muscular twitchings commenced. At 12:25 p. m. the respiration was 25. At 12:30 she fell down, displaying spasms with a peculiarly regular up-and-down movement of the head. Spasms occurred at short intervals until a little before death. At 1:28 p. m. the respiration was 19. At 1:37 p. m. the mouth was held open with the tongue out and breathing had almost ceased. Death occurred at 1:40 p. m.

Autopsy showed moderately congested abomasum, spleen dark and mushy, small intestine congested, lungs slightly congested; all other organs apparently normal.

Case No. 3—No. 26.

A yearling wether weighing 73 pounds was fed $1\frac{1}{2}$ pounds of green arrow-grass leaves at 11:40 a. m. At 12:50 p. m. he was down on his



Figure 7. Sheep in early stages of Arrow-Grass poisoning.

belly with legs stretched out, mouth open; very audible breathing through mouth, and distinct twitching movements of head and rolling of eyes. At 1 p. m., respiration 16, temperature 103.2. Had a series of spasms at regular short intervals until death, which occurred at 1:15 p. m.

Autopsy showed fourth stomach slightly reddened, small hemorrhages on heart; spleen darkened; all other organs apparently normal.

Case No. 4—No. 46.

A ewe weighing 70 pounds was fed $2\frac{1}{2}$ pounds of green leaves of arrow-grass between 2 p. m. and 4 p. m. She commenced to feel distressed and acted unnatural almost as soon as the feeding was finished, standing with head down, appearing very dull and caring little to move about. This state of inactivity was maintained until 5:45 p. m. when she commenced to brighten up, and at 7 p. m. appeared quite normal, for she was eating a little hay.

Case No. 5—No. 46.

The same sheep as in Case No. 4 was again fed the next day 2½ pounds at 9:20 a. m. and was very sick by 9:30 a. m. She was breathing through the open mouth, with frequent twitching movements of the muscles of the neck, wrinkling movements of the lips and a chewing movement of the jaws. At 9:45 a. m. she was down on her side with spasms most of the time until 9:50 a. m., when she began to regurgitate



Figure 8. Sheep down in convulsions, Arrow-Grass poisoning.



Figure 9. Sheep dying from Arrow-Grass poisoning.

food which passed out both through the mouth and nostrils. Death occurred at 9:55 a. m., thirty-five minutes after she was fed.

Autopsy (by Dr. R. C. Louck): Slight congestion of fourth stomach, large intestine congested; small hemorrhages on ventricles; all other organs apparently normal.

Case No. 6—No. 29.

A yearling lamb weighing 80 pounds was fed three-fourths of a

pound of green material between 9 a. m. and 10:20 a. m. He was sick at 10:30 a. m. ten minutes afterwards. Breathing through the mouth was very audible; and the animal was soon down on its side. The respiration was 50, temperature 101.4. He lay on his side with difficult breathing and series of spasms at frequent intervals until shortly before death, which occurred at 10:55 a. m., thirty-five minutes after feeding.

The autopsy showed small hemorrhages of the heart; all other organs appeared normal. Because of regurgitation shortly before death, the lungs contained food material.

Case No. 7—No. 60.

A ewe weighing 94 pounds was fed 8 oz. of the dry leaves at 4 p. m. At 4:50 p. m. she was down and unable to rise. Peculiar jerky movements of the head took place. At 5 p. m. she began having a series of convulsive spasms at intervals of four or five minutes until death, which occurred at 5:50 p. m. Just before death she vomited a little.

Autopsy showed slight inflammation of colon; severe congestion of both lungs; slight hemorrhages in the endocardium of the ventricles.

Case No. 8—No. 37.

A ewe weighing 83 pounds was fed 12 ozs. of the dry leaves between 4:20 p. m. and 4:45 p. m. At 5:30 p. m. she was dull and could hardly be induced to get up. Slight jerky movements of the muscles of the head and neck took place, becoming more pronounced until 7:20 p. m. When next observed, at 9:30 p. m., she was much better, being up and walking about, but still very much indisposed. Next morning at 8 a. m. she appeared to have fully recovered.

Case No. 9—No. 58.

A ewe weighing 101 pounds was fed 4 ozs. of the dry leaves between 10 and 11:30 a. m. At 5:15 p. m. she was breathing rapidly, the respiration being 150 per minute. This condition lasted until 7 p. m. No other symptoms were observed. Next morning she was eating a little hay; at 9:30 a. m. the following day she appeared to have fully recovered.

Case No. 10—No. 54.

A ewe weighing 115 pounds was fed 5½ ozs. between 2:30 p. m. and 3:30 p. m. At 4 p. m. she was sick, breathing through the mouth; respiration, 104; temperature, 103.6. While standing, frequent jerky muscular movements of the whole body took place. At 4:12 p. m. she was down with head and legs moving almost constantly, except during spasms when the legs were stretched out and the head and neck drawn back. The animal died at 4:35 p. m.

Autopsy showed considerable congestion in rumen and fourth stomach; spleen darkened and mushy; kidneys congested; abdominal lymph glands congested; lungs moderately congested.

Case No. 11—No. 58.

A ewe weighing 100 pounds was fed 2 ozs. of the dry leaves at 1:30 p. m. and 2 ozs. more at 2:30 p. m. At 3:20 she was sick; respiration, 70; breathing deep and audible; trembling of the muscles, especially those of the legs. At 3:40 she was down; respiration 30; breathing hard and very audibly through the mouth. She remained down with

head flat on the ground until after 5:10 p. m. At 5:50 p. m. she was up and able to walk, but still quite weak. At 7 p. m. she appeared to have fully recovered.

Case No. 12—No. 61.

A ewe weighing 100 pounds was fed 3 ozs. of air-dried leaves at 7:20 a. m. At 8:30 a. m. she was sick. Down on side with spasms at 9:30 a. m.; respiration, 44; temperature, 103.6. Breathing was mainly through the mouth. At 10 a. m. she was lying quietly on her side, breathing hard and audibly. Died at 10:15 a. m.

Autopsy showed considerable congestion of lungs and a few small hemorrhages of the heart. Other organs presented no gross lesions.

Case No. 13—No. 62.

A ewe weighing 82 pounds was fed 2½ ozs. of dry arrow-grass leaves at 7:30 a. m. Sick at 8:03 a. m., having a peculiar twitching of the muscles. Down on one side at 8:30 a. m. Frequent spasms occurred.



Figure. 10. Calf dying in convulsions from Arrow-Grass poisoning.

Respiration, 65; temperature, 104.2. At 8:45 a. m. respiration had fallen to 28. Death took place at 9 a. m.

Autopsy showed congestion of lungs and of the fourth stomach. Other organs appeared normal.

Case No. 14—No. 62.

A ewe weighing 82 pounds was fed 4 ozs. of dry leaves, an ounce at a time hourly in order to find out if the poison would be eliminated fast enough so that poisoning symptoms would not develop. The last feeding was at 4:20 p. m. and at 5 p. m. she was sick. The first noticeable symptom was a trembling of the muscles of the legs; respiration, 70. At 5:02 p. m. she was down, breathing through the mouth. She remained in this condition until after 6:30 p. m. At 7:30 p. m. she was up, walking around, but soon fell down again. She was soon on her feet again, but at 7:40 she had another spasm and fell down. At 10:30 p. m. she was up and able to walk around, her gait was very unsteady; the next morning at 7:30 a. m. she appeared to have fully recovered.

Case No. 15—No. 1.

A small yearling calf was fed 8 ozs., of which almost 1 oz. was left uneaten at 9:30 a. m. At 9:50 a. m. he was sick. Most of the time he lay on his side and at frequent intervals he had spasms when his head would be pulled back and legs stretched out. At 10:15 the respiration was 10; and he appeared to be dying. He died at 10:20 a. m.

The autopsy revealed no lesions.

Symptoms of Poisoning.

The first symptom noted was abnormal breathing, usually very rapid, often as high as 150 per minute, in sheep. In other cases it was slow and deep. As symptoms of poisoning developed, the animal breathed quite freely through the mouth, often with the tongue hanging out. This abnormal breathing was often accompanied by trembling or jerking movements of the muscles. In severe cases these jerking movements would develop into spasms or convulsions. After these started the animal would lie on its side panting through the wide-open mouth. From the time the animal went down until partial recovery or death there would be a series of convulsions at short intervals. Several of the animals vomited just before death, drawing part of the regurgitated material into the lungs, which may have hastened death.

Autopsy Findings.

The autopsy findings are few and not characteristic in any way, with the possible exception of congestion of the lungs. Fifty per cent of the cases showed endocardial or epicardial hemorrhages and forty per cent a spleen that was dark and mushy. In general, the blood was darker than normal and formed a clot that was rather soft. The moderate congestion observed in the intestinal tract is of little significance, and, because of the lack of uniformity of the location of the lesion, might be due to other causes. No odor of cyanide was noted in any of the cases; but all the autopsies were made in the open.

If these deaths were due to cyanide poisoning as indicated by the symptoms and chemical findings, the autopsy findings would probably be negligible. Various writers on toxicology consider the post-mortem changes in cyanide poisoning as of little aid in diagnosis. Nunn (*Veterinary Toxicology*, 1907, p. 130) states: "The post-mortem appearances are nothing characteristic, excepting the pervading smell of almonds from the intestines and in a lesser degree from the whole body." Friedberger and Frohner (*Veterinary Pathology*, Vol. I, Translation by Hayes, Sixth Edition 1908, p. 236) say: "Autopsy shows bright-red blood in acute cases, brown when chronic; smell of bitter almonds; signs of asphyxia."

Feeding Conditions under which Poisoning by Arrow-Grass Is Likely to Occur.

Few cases of natural poisoning have been observed. In one instance an owner of live stock stated that he had had a number of cows in corral on dry feed for some time. On releasing them they went directly to a patch of arrow-grass which they ate greedily. There was very little grass or sedge in the patch. The poisonous material was therefore but little diluted, and the death of several animals soon followed. The same stockman reported that he was very likely to lose animals when they were fed from a stack of wild-grass hay cut on

meadows containing large quantities of arrow-grass. A sheep owner reported the death of lambs when they fed late in the spring on meadows where arrow-grass was abundant. From the statement it appeared probable that death was due to this plant.

There seems some reason to believe that the plant might cause death in animals which had been on dry feed so long that they would fill up on almost anything green. There appears to be greater danger when the plant is fed dry in hay; the dose required to kill is then far smaller, and there is greater probability that a fatal quantity will be eaten.

Cure of Animals Poisoned with Arrow-Grass.

No experiments were made to determine whether it would be possible to cure a poisoned animal. Apparently there is little hope or prospect of success, because a dose large enough to cause illness is likely to cause death, and because the interval between the time when the first symptoms appear and the fatal result is too short to permit of treatment.

Prevention of Poisoning.

With arrow-grass as with other poisonous plants it appears that not much can be hoped for in the cure of animals already poisoned, but that a good deal can be done to prevent poisoning. Wet meadows, where arrow-grass is very common, should not be cut for hay. However, where the plant is distributed in small clumps rather uniformly and is not very abundant there is little danger. The largest clumps should not be cut, or, if cut, should not be loaded on the wagons and should be burned when dry. Animals should not be put on pastures containing an abundance of arrow-grass when they are very hungry. In some cases, moreover, portions of pastures and meadows where arrow-grass grows in great abundance should be fenced and left unused. By these methods it should be easy to prevent losses due to this poisonous plant.

PUBLICATIONS

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| 81..... | Water Hemlock (Technical). |
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| 93..... | Irrigation of Alfalfa in Nevada. |
| 94..... | One-Night Camps vs. Established Bed-Grounds on Nevada Sheep Ranges. |
| 96..... | Irrigation of Field Crops in Nevada. |
| 97..... | Don't Feed Fox-Tail Hay to Lambing Ewes. |
| 98..... | Arrow-Grass, a New Stock-Poisoning Plant. |
- Annual Reports for 1910, 1911, 1913, 1914, 1915, 1916, 1917, 1918.

Circulars:

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| 1..... | Glanders. |
| 5..... | Inspection of Nursery Stock. |
| 13..... | Anthrax. |



IN THE
SUPREME COURT OF THE STATE OF NEVADA

W. C. PITT, JOHN G. TAYLOR, PETER
ANKER, JOSEPH HILL, ET AL.,

Appellants,

v.

No. 2417

J. G. SCRUGHAM, STATE ENGINEER,

Respondent.

BRIEF AND ARGUMENT FOR RESPONDENT

The appellants, as plaintiffs in the court below, commenced an action against the defendant, as State Engineer, restraining him from carrying into effect on the Humboldt River Stream-System, Sections 18 to 39 of the Water Law of Nevada, Chapter 140, Statutes of 1913, as amended by Chapter 243, Statutes of 1915. A temporary injunction was granted against the respondent. Motion was made to dissolve the injunction which came on regularly for hearing and the lower court granted the order, dissolving the temporary injunction theretofore granted. From the last-named order appellants appeal.

The contentions of appellants are:

1. That Sections 18 to 39, both inclusive, and Sections 45, 46, 51, 88a, and 88b of the Water Law as amended are unconstitutional, invalid, null and void for the following reasons:

- (a) That they confer judicial power upon an administrative officer in violation of Section 1 of Article 3 of the State Constitution.
- (b) That Sections 18 to 39 divest the District Court of its original jurisdiction to try cases involving the possession or right of possession to water rights which are real estate.
- (c) That Sections 29, 30 and 31 divest the District Court of its original jurisdiction to try cases involving real property, and are in violation of Section 6 of Article 6 of the Nevada Constitution.
- (d) That there has been commenced in the District Court of Humboldt County, by Peter Anker as plaintiff, a general adjudication suit against all persons claiming appropriations on the Humboldt River Stream-System, and that the action of the State Engineer divests the District Court of its original jurisdiction to try said Anker case, and that the acts of the State Engineer under Sections 18 to 39 will be an invasion of said District Court's original jurisdiction.

- (e) That Sections 18 to 39 and Sections 88a and 88b are in violation of the due-process clauses of the State Constitution and of the Fourteenth Amendment to the Constitution of the United States.
 - (f) That the Water Law is inhibited by Sections 20 and 21 of Article 4 of the Nevada Constitution and is a special Act.
2. That the statute is invalid because the State does not own the water and that the Federal Government does.
- (a) That the water rights of appellants are vested by appropriation derived from the Federal Government and not from the State.

ARGUMENT

Dressed in slightly different garb, the Court has before it the identical questions presented in *Vineyard Land and Stock Company v. District Court*, 42 Nev. 1, and in *Bergman v. Kearney*, 214 Fed. 884. We will discuss the questions presented without endeavoring to follow counsel in his devious and tortuous course of argument. It is true that this Court has not as yet directly passed upon the validity or constitutionality of Sections 29, 30, 31 and 32 of the Water Law which provide for the filing and hearing of contest before the State Engineer. This question, however, was decided, and decided correctly, we think, in *Bergman v. Kearney*, 214 Fed. 884, 887, 889. We will, however, discuss all of these questions more in detail and in the order which we have above set out:

1. (a) That Sections 18 to 39 confer judicial power upon an administrative officer in violation of Section 1 of Article 3 of the State Constitution.

1. (b) That Sections 18 to 39 divest the District Court of its original jurisdiction to try cases involving the possession or right to possession of water rights which are real estate.

We will discuss 1(a) and 1(b) together.

In considering the constitutionality of Sections 18 to 39, inclusive, they must be viewed with reference to the purpose designed to be accomplished by Sections 52 to 58. Sections 18 to 39 may be called the "adjudication" provisions of the Act. Sections 52 to 58 are administrative provisions to be put into force when the relative rights of the respective water users upon the stream-system have been ascertained. The Act contemplates an exercise by the State of its power of administration for the purpose of properly, fairly and rightfully distributing to each appropriator on a stream-system the amount of water to which he is justly entitled. The State is the owner of the stream and the source of supply. The appropriators are not the owners of the stream, but have the right of diversion, appropriation, and application

to beneficial use. The Act contemplates not the deprivation by or through the State of any right of any appropriator. On the contrary, its real purpose is to ascertain and secure to water users their relative rights. It provides for an ultimate adjudication, a system of recordation, and the final establishment of title to this highest class of property which has too long depended, and which, without the benefits of this Act, must continue to depend and lie merely in the minds of living witnesses.

The Act has also, for its purpose, the determination of the amount of the unappropriated waters of the various stream-systems of the State, in order that the State in granting future appropriations may have full knowledge of the condition of the streams or stream-systems.

In order that the State may properly, or at all, regulate the use and provide for the fair distribution of water and grant further appropriations, it is necessary that the State determine the relative rights of appropriators upon the respective streams or stream-systems. No supervision by the State, no control by it under its police power and no regulation of the distribution and use can be effective without first making determinations and final adjudication of the relative rights of the various appropriators upon the stream. If the State is to regulate and exercise its police power in that regard, it must know what the relative rights of the various appropriators upon the stream are.

As said by Judge Farrington in *Bergman v. Kearney*, 241 Fed. 884, 891:

There can be no appropriation unless there is water to appropriate. There can be no just distribution of the waters flowing in a stream among those entitled thereto, until their respective rights and interests are known. Appropriation or regulation, without such knowledge, or supervision, which does not extend to and include early vested rights, will be both useless and mischievous. * * * The demand for regulation is more and more insistent, as the people of the State come to understand how limited is the supply, how immeasurable the need for water, and how essential it is to the general welfare that every stream and every foot of water within our boundaries should perform its largest possible economic service. In addition to this are the manifold and inevitable embarrassments and difficulties which arise from the fact that practically all Nevada water rights are undefined, and therefore debatable. * * * When these claims are adjudicated, so that they can be assured and identified with approximately the same precision which characterizes a deed conveying a parcel of land, much will be added to the value of the rights, and the temptation to turn surplus water into the sagebrush, in order to prevent others from acquiring adverse rights, will be removed.

Again, Coleman, C. J., in *Vineyard Land and Stock Company v. District Court*, 42 Nev. 1, 13, speaking of the purposes of the Act, said:

* * * the moving cause therefor was to provide a method whereby unappropriated water might be appropriated, and whereby the relative rights of existing appropriators of the waters of public streams

of the State might be determined without great delay and expense to such appropriators, and to enable the State to supervise and administer the distribution of such waters so that the greatest good might be attained therefrom for the development of our agricultural resources.

It is clearly within the legislative power to enact laws designed to remedy such general confusion and uncertainty as to title, and to require parties in possession and claiming title to establish the same in a proper proceeding. It is but an exercise of the police power of the State in the interest of the public welfare. *Bergman v. Kearney*, 214 Fed. 892; *Ormsby County v. Kearney*, 37 Nev. 314, 336, 339; *Farmers Independent Ditch Co. v. Agricultural Ditch Co.*, 45 Pac. 444; *White v. Farmers H. C. & R. Co.*, 43 Pac. 1028, 31 L. R. A. 828; *Louden Irr. Co. v. Handy Ditch Co.*, 43 Pac. 535; *Ex Parte Boyce*, 27 Nev. 299; *Noble State Bank v. Haskell*, 219 U. S. 104.

It is contended by counsel, however, that Sections 18 to 39, both inclusive, vest in the State Engineer judicial power contrary to the provisions of Section 1 of Article 3 of our State Constitution. This contention has repeatedly been decided contrary to the contentions of appellants in Oregon, in Wyoming, and in Nebraska, under similar statutes, which grant wider and greater powers to the State Engineer or to a similar or corresponding officer or body. In these States where the proceedings before the State Engineer are identical and where such proceedings result in the making of an order by the officer or board, *final in character and enforceable without proceedings in court*, the highest courts of these States in construing these provisions have said that they were administrative and not judicial. In *Re Willow Creek*, 74 Or. 592, 144 Pac. 507, 146 Pac. 475; *Pacific Live-stock Company v. Lewis*, 241 U. S. 440, 60 L. Ed. 1084; *Farmers Investment Co. v. Carpenter*, 9 Wyo. 110, 61 Pac. 258; *Enterprise Irr. District v. Tri-State Land Company*, 92 Neb. 121, 138 N. W. 171.

"At the most," as said by Judge Norcross in *Ormsby County v. Kearney*, 37 Nev. 315, "the powers granted are quasi judicial only." It must be remembered also that it is not every exercise of judicial power or discretion that is prohibited to administrative officers under Section 1 of Article 3 of the Constitution. It is only those judicial powers which are by the Constitution itself vested in some other officer, court or tribunal. *Bergman v. Kearney*, 241 Fed. 884, 896. 898; *Sawyer v. Dooley*, 21 Nev. 390.

The acts of the State Engineer authorized and directed under the provisions of Sections 18 to 39 are clearly administrative in character. True, they necessitate the exercise of discretion in the ascertainment of facts and, to a limited extent, the application of conclusions of law, but they are preparatory only. They result in no final order or

decree *enforcible* by the State Engineer or any one acting under or through his authority. Where, may we ask, in the Constitution, is any court vested with the power to make investigations and take the preparatory steps such as are devolved upon the State Engineer by Sections 18 to 39 of this statute? Certainly not in the Supreme Court, whose jurisdiction is appellate, and original only in the granting of certain writs, specially enumerated—not in the Justice's Courts or municipal tribunals, whose jurisdictional powers are limited by the Constitution and statutes—certainly not in the District Court, for it is given original jurisdiction in all "*cases in equity*" and all "*cases at law*," involving possession or right to possession of real estate. Most assuredly the acts of the State Engineer and the proceedings and steps which he takes under and pursuant to Sections 18 to 33 cannot by any stretch of imagination be called "*cases in equity*" or "*cases at law*." In *Re Silvies River*, 199 Fed. 501; *Farmers Investment Co. v. Carpenter*, 50 L. R. A. 755; *Ormsby County v. Kearney*, 37 Nev. 314, 344; *Vineyard Land and Stock Company v. District Court*, 42 Nev. 1, 28, 171 Pac. 173; *Miller on the Constitution*, 314-315; *State of Georgia v. Stanton*, 6 Wall. 50, 76; *Osborn v. Bank of the E. W. S.*, 9 Wall. 738, 879.

It is next contended by appellants that Sections 18 to 39 divest the District Court of its original jurisdiction to try cases at law involving the possession or right to possession to real estate, and are therefore in violation of Section 6 of Article 6 of the Constitution. It would seem almost enough to say that the proceedings before the State Engineer are not "*cases at law*," but are administrative proceedings to answer this contention of counsel. The District Court is granted "*original jurisdiction*"—in other words, original judicial power to pass upon cases at law. If the proceedings before the State Engineer are administrative in character, then the District Court cannot exercise administrative powers. It, too, is limited by the provisions of Section 1 of Article 3 of the Constitution, and the judiciary can no more trespass upon the administrative or executive branches of the government than they can trespass upon or invade the powers and prerogatives of the judiciary.

Counsel for appellants, however, is so earnest and insistent upon this phase of the case that we think it but just and fair to the Court to enter into a somewhat extended discussion of this branch of the case.

At the outset, it must be remembered that many of the sections of the Act of 1913 have been substantially and materially amended by the Act of 1915. The Water Law, as originally enacted, provided by Section 33 that, upon the making of the order of determination

by the State Engineer, water rights should be administered and water distributed in accordance therewith from the filing thereof in the State Engineer's office, *and could be stayed only by a bond given on appeal proceedings to the District Court.* Section 44 of the Act of 1913 provided that all final orders or decrees of the State Engineer shall be *conclusive* as to all appropriators upon the stream or embraced within the adjudication, subject only to the provisions of law for *appeals, rehearings, and for reopening of the orders or decrees therein.* Sections 34, 35, 36, 37 and 38 of the Act of 1913, as originally enacted, provided for and regulated appeals from the order of determination of the State Engineer to the District Court. Section 41 provided for a stay of the decree of the State Engineer after the appeal had been perfected, by the filing of a bond to be approved by the District Court.

It is immediately apparent that the Act of 1913 invested the State Engineer with the power to make final decrees and to enforce them; and that the Act provided for *appeals* from the order of the State Engineer to the District Court. This made the Act subject to two objections as to its constitutionality: First, that it actually, really and substantially vested judicial power in the State Engineer in that it authorized him to hear and determine controversies concerning real estate, enter a decree and enforce it, thereby invading the original jurisdiction of the District Court; and, second, in providing for appeals to the District Court from such decrees of the State Engineer, it clearly violated the provisions of Section 6 of Article 6 and Section 1 of Article 6 of the State Constitution, for the construction placed upon these two provisions is that the appellate jurisdiction of the District Court extends only to cases arising in the Justice's Courts and municipal tribunals.

This Court, for the reasons which we have stated, held the act unconstitutional (*Ormsby County v. Kearney*, 37 Nev. 314). The Legislature met this situation, and we think successfully, by the amendments of 1915. Section 25, which theretofore had provided for a forfeiture of right for failure to file proofs of claims before the State Engineer, was substantially amended by providing that upon such default or neglect such appropriators' rights should be determined by the State Engineer from such evidence as he may obtain or may have on file in his office, and specifically provided that exceptions to such determinations may be filed in court as hereinafter provided. Section 30 regulating the practice upon contest was amended, and Section 33 was amended, requiring the State Engineer to make his order of determination and file the same in his office and serve a copy by registered mail upon interested parties, omitting therefrom any grant of power to enforce,

or make effective such order of determination, or to distribute water in accordance with it. Sections 34, 35, and 36 were in effect repealed and new sections substituted for them. Section 34, as amended, provides for the filing of the order of determination with the proper District Court and for the issuance of an order by the Court setting the time for hearing, which order is required to be served and published. Section 35 now provides for the filing of exceptions by any person dissatisfied or aggrieved with the order of determination and specifically designates the order of determination, the *statement of claims* and *exceptions* to the order of determination as pleadings and that there shall be no other pleadings in the cause. The section also provides that all proceedings thereunder shall be as nearly as may be in accordance with the rules governing civil cases. Section 36 provides for the appointment of disinterested experts by the Court who shall be subject to examination by any party in interest. It also provides that the *case*, or any part thereof, may be rereferred to the State Engineer for further determination and subject to the Court's instructions. This section also provides for the entry of the decree and for appeals to the Supreme Court therefrom. Section 37 provides for the filing of a certified copy of the decree with the office of the State Engineer. Section 38 provides that from and after the filing of the determination in the District Court, and during the hearing in the District Court, the water shall be divided and distributed from the stream in accordance with the determination—in other words, making the order of determination as a complaint *prima facie* correct and shifting the burden upon the party contesting it. Section 39 provides for a stay of the order of determination, in whole or in part, upon the giving of a proper bond to be approved by the Court.

The provisions of the amendments radically and materially depart from the original Act of 1913. While the original provisions providing for the selection of the stream-system, for preliminary reconnaissance by the State Engineer, for the use of data and surveys, for the taking and filing of proofs, for the payment of costs, for the filing and hearing of contest, and for the making of rules and regulations concerning the same, remain the same, the State Engineer is, by Section 33 and the repeal of Sections 34, 35, 36, 37, 38, 39, 40, 41, 42, and 44 of the Act of 1913, completely shorn of the power to enter any order, which has the effect of a final decree and which is enforceable by the State Engineer. On the contrary, his order of determination is of no force and effect in the office of the State Engineer. It is required to be filed under the provisions of the new Section 34, with the District Court, and under the provisions of the new Section 35 becomes a pleading in the cause. Stay of execution is provided for, not by an undertaking on appeal,

and after the appeal is perfected as in the original Act, but as a part of the original jurisdiction of the District Court. The order of determination has none of the elements of judicial power. Judicial power is defined by Mr. Justice Miller in his celebrated work on the Constitution as :

Power of a court to decide and pronounce a judgment and carry it into effect between persons who bring a *case* before it for decision.

See, also, Miller on the Constitution, p. 314; *Western Metals Supply Co. v. Pillsbury*, 156 Pac. 491, 493; *Muskraat v. U. S.*, 219 U. S. 346, 356; *Interstate Commerce Commission v. Brimson*, 154 U. S. 447; *Bergman v. Kearney*, 241 Fed. 884, 898, 899.

In *Underwood v. McDuffee*, 93 Am. Dec. 193, 194, the Court said :

No action which is merely *preparatory* to an order or judgment to be rendered by *some different body*, can be properly declared judicial.

In *Bergman v. Kearney*, *supra*, page 906, the Court said :

The purpose of the proceeding is to promote the public welfare by regulating the use and preventing the waste of the waters of the State. His determination, though obtained judicially, *has none of the elements of finality and conclusiveness which are the sine qua non of judicial power*. As an ascertainment of relative rights, it is not effective for the administrative purposes of regulating and controlling the distribution and diversion until it is filed in court. * * * Until it is so filed, it has no more force than the findings of a referee. It is not a decree or judgment in the sense that it terminates the litigation upon the merits between parties; therefore there is nothing to appeal from. When it reaches the court, there is no necessity for an appeal; there its principal function is to serve as one of the pleadings.

We think that the true character of the proceedings before the State Engineer, and particularly the order of determination, is most accurately and distinctly stated by Coleman, C. J., in *Vineyard Land and Stock Co. v. District Court*, where it is said :

The fact of the matter is that the entire proceedings amount to nothing until a copy of the order of determination of the State Engineer is filed in the office of the Clerk of the District Court. When this document is filed in that office it operates as and has the force and effect of a complaint, and from the time of the filing thereof the water of the public stream concerning which the order is made is divided among claimants according to the terms of such order, unless a bond is given pending a decree of the District Court. * * *

If this language means anything, it means that the adjudication—the determination, the decree—is made by the Court; and the proceedings before the water board in Oregon, to which the State Engineer in Nevada holds relatively the same position, is nothing more than the routine of preparing and filing the complaint in the court, which invests the court with jurisdiction to act.

Suppose the water law had provided that the Attorney-General might proceed exactly as it now provides that the State Engineer may proceed, up to the point of the making by the State Engineer of an order of determination, and in lieu of the proceedings provided under the law as it now stands, from the time of making the order of deter-

mination, had provided that the Attorney-General should, from the information to be gathered in the same manner as now provided by law, prepare and file in the District Court a complaint setting forth substantially the same facts contained in the State Engineer's order of determination, and that from the filing thereof the proceedings thereupon should be identically the same as those now contemplated by the water law, would any one insist that any constitutional right would be violated? We think not. Yet, what is the difference between conferring such power upon the State Engineer and the Attorney-General? We see no difference.

Counsel for appellants insists, iterates and reiterates his distinctions between the Constitutions of Nevada and Oregon upon the question of the powers of the Circuit and District Courts respectively. In one breath, in his brief, he insists that our law is not taken from Oregon or any other State, and in the next insists that it is exactly the same as Oregon, but that the constitutional provisions are different. We admit that the Constitutions of Nevada and Oregon are different. We likewise insist that our statute, because of this difference or distinction, departs radically from the Oregon statute. Under the Constitution of Oregon, the Circuit Court has appellate jurisdiction and supervisory control over the county court and all other inferior courts, officers and tribunals. In Nevada the District Court has appellate jurisdiction only over Justice's Courts and municipal courts. It has no appellate jurisdiction or supervisory control over any other court which might be created by the Constitution or over any other officer, inferior court, or tribunal. Under the Constitution of Oregon it is, therefore, possible to *appeal* from the State Water Board to the Circuit Court. Under the Constitution of Nevada, it is not possible or permissible to vest the District Court with appellate jurisdiction over the State Engineer. Here we have the sole and real distinction between the constitutions of the respective States.

Bearing this distinction between the respective constitutions in mind, we look to the statutes of the respective States. In Oregon we find that the order of determination is made by the water superintendent and is filed with the Water Board. Upon the filing with the Water Board it becomes effective and water is thereafter distributed in accordance with its terms by the water superintendent and water commissioners provided for by sections similar to our Sections 52 to 58. In Oregon the order may be stayed by filing a bond with the Water Board. These provisions are similar to the provisions of the Nevada law of 1913 prior to the enactment of the amendments of 1915. Since the enactment of the amendments of 1915 Section 33 provides for the making of the order of determination and for its filing with the State Engineer, but the State Engineer is completely shorn of any power to distribute water in accordance with its terms, until it is filed as a complaint in court

under the provisions of Section 34. The administrative provisions of Sections 52-58 come into effect only from and after the filing of the order of determination as a complaint in court. Under the Nevada Act as amended the order of determination has no element of finality or conclusiveness. It concludes nothing; it binds no one, and it is unenforceable so long as it remains in the office of the State Engineer. Life is breathed into it only when it is filed as a complaint in the District Court; then it becomes *prima facie* correct (Section 38), and water is distributed in accordance with its terms, unless it be stayed by the filing of a bond and the approval thereof by the District Court. The distinction between the two statutes is so manifest that any one not blinded by a cataract of prejudice may readily see and read.

The appellants place great stress upon the words "exceptions" and "affirming" in Section 35, and the words "affirming or modifying" in Section 36. They insist that the word "exception" must be taken in the narrow sense, as used in the Civil Practice Act, for the preservation of the record for the purpose of review. We insist that the word "exception," as used in Section 35 and as used in Section 25, was intended by the Legislature to mean an informal pleading to be filed on behalf of any appropriator placing in issue the correctness of the whole or any part of the order of determination. A reading of the section shows that it was the intent of the Legislature that the order of determination should constitute a general bill of complaint for the purpose of adjudication; that the statement of claim of the appropriator should constitute his affirmative statement of his rights upon the stream-system, and the exception should constitute his traverse of the correctness of the whole or any part of the order of determination which he desires to put in issue.

Section 35 provides:

If no exception shall be filed with the Clerk of the Court. * * *
the Court shall enter a decree affirming said order of determination.

Counsel insists that the words "affirming or modifying" show that the intent of the statute was to vest appellate and not original jurisdiction in the District Court. These words, however, have been construed both by this court and the Federal Court of this district. In *Bergman v. Kearney*, 241 Fed. 884, 896, the Court said:

It operates not as a judgment, but as a pleading or the findings of a referee. True, it may be affirmed without additional testimony, if no exceptions are filed. *This is equivalent to the taking of a decree pro confesso when the allegations of the bill are sufficient to support the decree asked.* *Shukins*, Federal Equity Suit, p. 388.

A similar proceeding occurs when judgment, by default, is taken against a defendant who fails to answer in an action upon contract for the recovery of money or damages only. *Rev. Laws Nev., sec. 5236.*

In *Vineyard Land and Stock Co. v. District Court*, 42 Nev. 1-31, 171 Pac. 167, 174, this Court said:

It is contended that, should an interested party fail to file objections with the Clerk of the District Court in which the State Engineer files a copy of his order of determination, and the Court enters a decree in accordance with such order of determination, such decree would be tantamount to a taking of property without due process of law. If what we have said of the character of the proceedings up to and including the filing of the copy of the order of determination with the Clerk of the District Court is sound, we fail to see wherein an interested party who fails to file such exceptions would be in a worse position than the defendant in the ordinary suit in the District Court who fails to plead when duly summoned, and against whom a default judgment is entered. Yet no one would contend that such default judgment, in the ordinary suit, would be equivalent to taking property without due process of law.

In fact, it is manifest from a reading of the whole Act that it was the intent of the Legislature to make the proceedings in the District Court original in character and to offer to every appropriator upon the stream or stream-system a full opportunity to test the correctness of the State Engineer's decision. If exceptions are filed, there must be a trial in the District Court. At such hearing, the Court will not confine the appropriators who file exceptions to a mere reexamination of the record of the evidence given before the State Engineer, but will at all stages of the proceedings follow as near as may be the rules governing civil actions. *Bergman v. Kearney*, 241 Fed. 884, 906.

The statutes specifically provide that all proceedings thereunder shall be as near as may be in accordance with the rules governing civil actions. No court would be justified in construing these general words otherwise than to confer upon the court full original jurisdiction for the purpose of hearing and determining the case before it.

1. (c) That Sections 29, 30, 31 and 32, providing for contests before the State Engineer, divest the District Court of its original jurisdiction to try cases involving real property and are in violation of Section 6 of Article 6 of the Nevada Constitution.

It is insisted by the appellants that the provisions of Sections 29-32 providing for contests before the State Engineer are invalid and that they confer judicial power and power to determine the right to possession of real property upon the State Engineer, an administrative officer. We think this contention of counsel cannot be sustained. It must be remembered that each and every step prescribed by Sections 18 to 32, inclusive, are but preparatory to the order of determination. The order of determination is the result of these steps and proceedings. This court, and the Federal Court of this district, in *Bergman*

v. Kearney, *supra*, and in Vineyard Co. v. District Court, *supra*. held that the making of the order of determination is an administrative act. How, then, may we ask, can any other step, preliminary or intermediate or preparatory to the order of determination, be otherwise than administrative? It is true that, under the provisions with reference to contest, contests are filed, hearings are had and evidence taken, but they result not in a judgment or decree, or any other order which is final or conclusive. The result of the contests, as well as every other intermediate proceeding, is the order of determination which of itself is not a judgment, but a mere pleading to be filed in the District Court. The making of the order of determination by the State Engineer is the exercise of administrative powers and not judicial. In Underwood v. McDuffee, 93 Am. Dec. 194, 196, the Supreme Court of Michigan said:

*No action which is merely preparatory to an order of judgment to be rendered by some different body can be properly termed judicial. A master in chancery often has occasion to consider questions of law and of fact, but no one ever supposed him to possess judicial power. A jury in a court of record determines all the facts in a case, but the judicial power is in the court which enforces the verdict by judgment. This view is very clearly explained by Kent, C. J., in Tillotson v. Cheetham, 2 Johns. (N. Y.) 63 (3 Am. Dec. 459), where it was held that the sheriff himself, when presiding over a jury of inquest, acted ministerially, because he had no power to give judgment. * * * It is the inherent authority, not only to decide, but to make binding orders or judgments, which constitutes judicial power; and the instrumentalities used to inform the tribunal, whether left to its own choice or fixed by law, are merely auxiliary to that power, and operate on persons or things only through its action, and by virtue of it.*

See, also, Southern Pacific v. Bartine, 170 Fed. 725, 773; Idaho Power Co. v. Blomquist, 141 Pac. 1083; United States v. Ferreira, 14 L. Ed. 42; Hayburn's Case, 1 L. Ed. 436.

In Bergman v. Kearney, 241 Fed. 884, 906, the Court said:

I am therefore of the opinion that the Act of 1913, as amended in 1915, in so far as it authorizes the State Engineer to take evidence and determine water rights for administrative purposes, is not unconstitutional. The power exercised in the ascertainment of water rights for administrative purposes only is not judicial power in the constitutional sense; nor, in so far as the engineer is authorized to take evidence and determine water rights for the final adjudication of the titles of various claimants among themselves, is he vested with judicial power. What he does is merely preliminary, the initial step in a proceeding which culminates in a final decree by the District Court; thus it is not the engineer, but the court, which exercises the judicial power of the State of Nevada.

When we come to an examination of the provisions of Sections 29, 30, 31 and 32, we find that no decision is required upon the contest, but that they merge into the order of determination. If the order of determination is not a final judgment and is unenforceable, how can it be said that any intermediate step is the exercise of judicial power?

The real purpose to be served by the contest provisions of the statute is readily ascertained from a reading of Sections 28 and 33 in connection with the contest Sections 29, 30 and 31. Section 28 provides for the assembling in abstract form all proofs of appropriators, and when so assembled, the State Engineer, after notice, publishes them by opening them to the inspection of any interested party at certain designated places on the stream-system. The contests are authorized for the purpose of permitting any appropriator to test the correctness of any claim or proof of any other appropriator on the stream-system and thereby assist the State Engineer in arriving at an order of determination which will be as nearly correct as possible. In this connection, it must always be borne in mind that the order of determination, when filed in court will be *prima facie* correct—that after filing in court, water is distributed to the appropriators upon the stream-system in accordance with its terms, and in the priority and amounts set forth therein, pending the entry of the final decree by the court. Human nature is the same the world over. Many claimants will undoubtedly claim earlier priorities and greater flows than they are justly entitled to, and if these claims are not permitted to be tested by contest, but allowed to rest upon the *ex parte* proofs of the claimants, it will be difficult—aye, practically impossible in many instances—for the State Engineer to arrive at an accurate order of determination, and bona-fide appropriators may be deprived, *pendente lite*, of the use of water to which they are justly entitled, or compelled to give bond for the stay of the order.

We think that the Legislature acted wisely in providing for these contests as one of the preparatory steps in arriving at the order of determination.

Appellants do raise one question relative to contest which is of real and serious moment. In our view of it, however, it is one of construction and not of constitutionality. It is insisted by the appellants that a claimant who fails to contest any proof of claim before the State Engineer is barred from traversing by exceptions and putting in issue the correctness of such claim in the District Court, and that such noncontesting claimant may not offer or submit evidence in support of the issue thus tendered.

Counsel for appellants seem to be of the opinion that a claimant who fails to contest before the State Engineer is precluded from tendering any issue or introducing any proof to overthrow or modify the order of determination. They take the position that the exceptions will but search the record and that the record is made in the State Engineer's office. Such construction is consistent only with appellants' theory that the proceeding before the State Engineer is judicial, and that the proceeding before the District Court is appellate. This theory is

inconsistent, however, with the law as construed by this court that Sections 18 to 33 are *administrative and not judicial*, and that the jurisdiction of the District Court is *original and not appellate*. That the noncontesting appropriator may fully present his case in evidence to overthrow the correctness of the order of determination, is clear. The District Court's jurisdiction is original, and, being original, it is not confined to the record made by any administrative officer in a preparatory proceeding. Sections 35 and 36 specifically provide for hearings and by the taking of testimony and evidence by the court in support of exceptions. In *Bergman v. Kearney*, *supra*, page 906, the Court said:

There its proper function is to serve as one of the pleadings. If no exceptions are filed, the Court is justified in assuming that it reasonably satisfies all parties and a decree will be entered affirming the order of determination. *If any exceptions are filed, there must be a trial in the District Court. At the hearing, the Court is not confined to a mere reexamination of the record and evidence as heard by the State Engineer, but will in all its proceedings follow as near as may be the rules governing civil actions.* It may require further evidence or determination from the State Engineer, or a report from such experts as it may employ to make an investigation.

The right of trial is a real, substantial right. Nowhere does the Act prohibit any person from offering his evidence on the trial. There is no express prohibition in the statute against a noncontesting appropriator offering evidence upon the trial, and certainly no court would read such an inhibition into the statute. In *Bergman v. Kearney*, *supra*, at page 887, the Court said:

If any person claiming an interest desires to object to any other claim, he may initiate a contest by filing in writing with the engineer a written statement under oath, setting forth the grounds of the proposed contest. *The contestant may, if he prefers, accomplish the same purpose by filing later with the Clerk of the Court in which the adjudication will be made his exceptions to the engineer's determination.* When a notice of contest has been filed with the engineer, it is his duty to fix a time and place for the hearing.

1. (d) That there has been commenced in the District Court of Humboldt County, by Peter Anker as plaintiff, a general adjudication suit against all persons claiming appropriations on the Humboldt River Stream-System, and that the action of the State Engineer divests the District Court of its original jurisdiction to try said Anker case, and that the acts of the State Engineer under Sections 18 to 39 will be an invasion of said District Court's original jurisdiction.

The appellants insist that because an action has been commenced by one of the appropriators upon the stream for the general adjudication of the water rights of the Humboldt River Stream-System, that

the action of the State Engineer in following out the mandates of Sections 18 to 39, will divest the District Court of its original jurisdiction to try the Anker case and will be an invasion of the District Court's original jurisdiction.

We must at all times bear in mind the ultimate purpose of Sections 18 to 39. As we have pointed out, the purpose of all of these sections is to so adjudicate the stream-system that the provisions of Sections 52 to 58—the administrative, police-control provisions—may be put into effect. Sections 52 to 58 can only be invoked after the stream has been adjudicated in accordance with the provisions of Sections 18 to 39 of the Water Law. No general adjudication suit, no matter how complete, can bring these provisions into effect or authorize the State Engineer to distribute the waters of any stream or stream-system. *Wattles v. Baker County*, 117 Pac. 417; *Parshall et al. v. Cowper*, 143 Pac. 302; *Van Buskirk v. Red Buttes L. & L. S. Co.*, 156 Pac. 1122, 1225; *Opinions of the Attorney-General, 1917-1918*, p. 15; *Ormsby County v. Kearney*, 37 Nev. 314, 338.

The Anker suit is called a general adjudication suit and binds the parties to the suit only. It determines only their relative rights. The action authorized by the Water Law, under the provisions of Sections 18 to 39 is not between the same parties. On the contrary, the State is interested in ascertaining not only the relative rights of the appropriators, but the amount of the water unappropriated, remaining in the State subject to further appropriation and permits of the State Engineer. A decree in a general adjudication suit would be binding upon all parties to the decree and as between such parties in the State Engineer's proceeding, and the State Engineer and the courts, when the case is filed in court, would be bound by such decree in ascertaining the relative rights of the appropriators, but neither the State nor the State Engineer nor the court, would be bound by any such general adjudication decree. In *Wattles v. Baker County*, 117 Pac. 417, 419, construing similar provisions of the Oregon law, the Supreme Court of Oregon said:

Taking all these provisions together, we are of the opinion that the words "established rights," and "determined rights," and "existing decrees," used in the Act, refer only to such rights as are determined and established by the action of the Board of Control, pursuant to the Act of 1909, and to decrees made under the provisions of the same Act; and that for that reason the water master had no authority to act in the matters set forth in the complaint. The intent of the Act seems to be to place the control of irrigating water under the jurisdiction of the Board of Control as rapidly as rights are determined by it, and become a matter of record in its office. When the board convenes to determine such rights, prior decrees, made independent of action by the board, are conclusive upon it as between the parties to such decrees, and thereafter the rights established

thereby may be enforced by the water master, the same as though they had been originally determined by the board. But, in the absence of such determination in accordance with the Water Code, such rights must be enforced by the court making the decree.

We think it cannot be said, merely because two suits concerning either the same or similar subject-matter, and between the same or similar parties may be commenced in the same District Court, that this constitutes an invasion of the original jurisdiction of the District Court to try either of them. The pendency of either of the suits might, under proper circumstances, be grounds for a plea in abatement, but neither should be said to divest the District Court of any part of its original jurisdiction, but, as we have already pointed out, the parties are not identical and the objects and purposes of the suits are not the same. We think there is no merit in this contention of the appellants.

1. (e) That Sections 18 to 39 and Sections 88a and 88b are in violation of the due-process clauses of the State Constitution and of the Fourteenth Amendment to the Constitution of the United States.

It is contended that Sections 18 to 39 are in violation of the due-process clause of the State Constitution and of the Fourteenth Amendment to the Constitution of the United States. It has been repeatedly held that the Legislature may commit the preliminary and preparatory investigations to administrative officers, and the final decision, judgment or decree to the courts, and that this does not constitute a violation of the due-process clauses of the Constitution. *Bergman v. Kearney*, 241 Fed. 884; *Anderson v. Kearney*, 37 Nev. 317; *Vineyard Land and Stock Co. v. District Court*, 171 Pac. 167, 171, 172; *Pacific Livestock Company v. Lewis*, 241 U. S. 440, 60 Fed. 1084.

Every step in the proceeding is attended with due notice. As said by Coleman, C. J., in *Vineyard Land and Stock Company v. District Court*, *supra*, 171 Pac. 169:

It certainly cannot be said that this law is in violation of the constitutional provision mentioned because of failure to provide for the giving of ample notice to all interested parties, for we doubt if, in the history of legislation, an act was ever passed in which so many safeguards were provided that a man might not be deprived of his property in a proceeding without knowledge of such proceeding being brought to his attention.

Counsel also insists that there can be no due process of law except by the methods, means and instrumentalities in existence at the time of the adoption of our Constitution. This court has held the contrary, and to go into any extended discussion would but needlessly take up the time of this court. *Vineyard Land and Stock Co. v. District Court*, 171 Pac. 171, 172; *State v. Millain*, 3 Nev. 409.

It is also insisted that Sections 88a and 88b are in violation of the due-process clause of the State and Federal Constitutions. Section 88a provides that maps, plats and surveys and evidence on file in the office of the State Engineer heretofore gathered by the State Engineer may be taken into consideration by him in arriving at any order of determination, provided that at least ninety days' notice of his intention to consider them shall have been given to all parties interested. Notice is to be given in the manner prescribed in Section 22 of the Act. Within sixty days after the giving of such notice, any party interested may file supplemental maps, additional maps, plats and surveys or evidence which shall also be taken into consideration by the State Engineer. Appellants insist that this is all *ex parte* and the consideration thereof by the State Engineer would be violative of due process. Appellants are clearly in error. The evidence is not considered until after notice to the parties interested. They are given full, fair, and ample opportunity to rebut it by any other competent evidence and to object to its admissibility. This question was squarely presented to this court in the case of *Steamboat Canal Company v. Garson*, 185 Pac. 801, where this court, through Ducker, J., said:

The contention that the testimony and data obtained at the former hearing after due notice that it would be submitted and considered was an infraction of the strict rules of evidence which prevailed in the trial of cases in courts of law, but administrative boards of this character are not hampered by technical procedure. True, they cannot dispense with the essential rules of evidence which conduce to a fair and impartial hearing, but, from the nature of their organization and the duties imposed upon them by statute, they are essentially empowered with liberal discretion in passing upon the competence of evidence.

The argument advanced with reference to Section 88a applies with equal force to Section 88b.

1. (f) That the Water Law is inhibited by Sections 20 and 21 of Article 4 of the Nevada Constitution and is a special Act.

The Act is not in violation of Section 20 or 21 of Article 4 of the Constitution. We think this has been too often decided by this court to merit discussion. The law applies equally to all appropriators of water and to all stream-systems of the State and to all actions brought under the Act, and is neither a special law nor class legislation within the inhibition of Sections 20 and 21 of Article 4. *Young v. Hall*, 9 Nev. 212; *State v. Mining Co.*, 15 Nev. 234; *State v. Mining Co.*, 16 Nev. 432; *State v. State Bank and Trust Co.*, 37 Nev. 456; *Sawyer v. Dooley*, 21 Nev. 391; *Southern Pacific Co. v. Bartine*, 170 Fed. 725; *Mo. Pac. Co. v. Mackey*, 127 U. S. 205; *Chicago R. R. Co. v. Arkansas*, 219 U. S. 453.

In *Bergman v. Kearney*, *supra*, the court said :

The objection that the Act is repugnant to Sections 20 and 21. Article 4 of the Nevada Constitution, is without merit. The Act applies equally and uniformly to every stream and stream-system and to every water user in the State. Water rights are unique. The Act of the Legislature in placing them in a class by themselves is neither unreasonable nor arbitrary; it is based on a real and substantial difference between water rights and other classes of property.

2. That the statute is invalid because the State does not own the water and that the Federal Government does.

The United States became the owner of the lands and waters lying within the present boundaries of the State of Nevada under the treaty between the United States and Mexico of Guadalupe de Hidalgo, and unquestionably, until the admission of Nevada into the United States, was the owner of all the lands and waters within the State, both as sovereign and as proprietor. Upon the admission of the State into the Union, the enabling Act provided for the ceding to the General Government of all of the land not in private ownership, lying within the boundaries of the State (Rev. Laws, 212). This was done in the ordinance of the Constitution of Nevada (Rev. Laws, 228). It will be observed that the only disclaimer, however, was to "all right and title to the unappropriated public *land*" lying within the boundaries of the Territory. No reservation was made by the General Government and no cession by the State to the General Government of any of the public waters within the State. The ownership of the Government of the United States of the public lands is not that of a sovereign. It is proprietary only. The United States Government stands in the same position with reference to the ownership and rights as any private individual. *U. S. v. R. R. Company*, 27 Fed. Cases, 686, Fed. Case No. 16114; *Moore v. Smaw*, 17 Cal. 199; *People v. Shearer*, 30 Cal. 645, 658.

A grant from the United States of its public lands bounded on streams or other waters is to be construed according to the laws of the State in which the land lies. *Harden v. Jordan*, 140 U. S. 371, 35 L. Ed. 428.

On admission of a new State, shore lands or tide lands belong to the State. *Shiveley v. Bowler*, 152 U. S. 1, 38 L. Ed. 331.

The right of the United States to the public lands and the power of sale in Congress confers no right to grant lands on the banks of the Mobile River, which were below high-water mark at the time Alabama was admitted to the Union. *Pollard v. Hagan*, 3 How. 212, 11 L. Ed. 565.

California, by virtue of its admission to the United States, became the owner of the navigable rivers and the soil under the same. *Mumford v. Wardwell*, 6 Wall. 423, 18 L. Ed. 756.

We think there can be no question that in the State is vested the waters of natural streams, but, even were that not the law, the Government of the United States has specifically recognized the rights of Legislatures to regulate and control the waters of natural streams within their boundaries by the Act of 1866 (14 U. S. Stats. at Large, 2551).

In *Basey v. Gallagher*, 87 U. S. 670, 683, the Supreme Court of the United States said :

It is very evident that Congress intended, although the language used is not happy, to recognize as valid the customary law with respect to the use of water, which has grown up among the occupants of the public lands under the peculiar necessities of their condition, and that law may be shown by evidence of the local custom, or by the legislation of the State or Territory or the decisions of the court.

The Congress of the United States has also specifically recognized the doctrine of appropriation by the Act of March, 1877, providing for the sale of desert land in Nevada and other States. Compiled Statutes 1916, sec. 4674.

In view of these enactments and the various statutory declarations of the State, we think there can be no question of the rights of the State to enact the legislation in question. *Kansas v. Colorado*, 206 U. S. 46, 51 L. Ed. 956, 973; *Gutierrez v. Albuquerque Land & Irr. Co.*, 188 U. S. 545, 47 L. Ed. 588; *Bergman v. Kearney*, 241 Fed. 884, 892, 893.

In conclusion, we submit that the Act in question is constitutional in all respects. The Act is a proper exercise of the police power of the State, for we think it unquestioned that the public welfare and the advancement of our agricultural interests demand that the titles to this highest class of property shall be made certain and definite. That each appropriator's right shall be measured and identified. The Legislature, in providing the means, will have performed its highest duty. More than seven hundred appropriators claim rights to the use of the water of the Humboldt River. These rights are indefinite and uncertain. Not a single appropriator upon this whole great stream can today, with any degree of certainty, make a conveyance of any definite or accurate amount of water; nor can he say that he may not, by the misfortune that may occur through the death or removal of witnesses, lose the benefit of his early priority, or have cut down the amount of the flow which he claims, because, as these water rights stand at the present time, they are not matters of record, but exist only in the minds of living witnesses. Many of these rights are old, dating back as early as 1862. Let a few more years pass and it will be difficult—aye, almost impossible—for an appropriator claiming an early priority to make proof before the courts, such as is necessary to sustain title. Let this Act be sustained, properly construed, and every man's right upon

the stream-system will be preserved—he will obtain a certificate of title which will be definite, clear, and beyond attack. This certificate will become a matter of record, and a man's water right can be ascertained by an examination of the records, and no one can dispute it.

Under the administrative provisions of the Act, each appropriator will be given, and have distributed to him, the amount of water to which he is entitled and which his necessity demands. The waters of the streams will be conserved and will perform their highest function.

Respectfully submitted,

LEONARD B. FOWLER,

Attorney-General.

ROBERT RICHARDS,

Deputy Attorney-General.

NORCROSS, THATCHER &

WOODBURN,

Attorneys for Respondent.

AGRICULTURAL EXPERIMENT STATION
THE UNIVERSITY OF NEVADA

Annual Report of the Board of Control for the Fiscal Year Ending June 30, 1919

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1920



NEVADA AGRICULTURAL EXPERIMENT STATION

BOARD OF CONTROL

HON. A. E. CHENEY (1921)	Reno
HON. B. F. CURLER (1921)	Elko
HON. WALTER E. PRATT (1925)	Reno
HON. MRS. W. H. HOOD (1927)	Reno
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N. F. PETERSON, B.A., M.A.	Assistant in Range Management
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RUTH MILLER, B.A.	Secretary to Veterinary Department
M. R. MILLER, B.S.	Chemist
HESTER MATOTTE	Librarian and Secretary to Director

FINANCIAL STATEMENT

C. H. GORMAN

Nevada Agricultural Experiment Station

IN ACCOUNT WITH

The United States Appropriations, 1918-1919

Items	Hatch Fund	Adams Fund
Debit		
To balance from appropriations for 1917-1918	\$0.00	\$0.00
Receipts from the Treasurer of the United States, as per appropriations for fiscal year ended June 30, 1919, under Acts of Congress approved March 2, 1887 (Hatch Fund), and March 16, 1906 (Adams Fund)	15,000.00	15,000.00
Credit		
Abstract		
By salaries	\$9,889.80	\$9,483.33
By labor	1,989.07	2,485.42
By publications	680.71	
By postage and stationery	151.58	71.37
By freight and express	22.07	120.09
By heat, light, water and power	162.52	15.06
By chemical and laboratory supplies	93.06	151.41
By seeds, plants and sundry supplies	155.63	189.27
By fertilisers	0.00	0.00
By feeding stuffs	796.00	1,072.41
By library	40.45	2.50
By tools, machinery and appliances	76.09	33.73
By furniture and fixtures	162.06	3.00
By scientific apparatus and specimens	0.00	44.67
By live stock	290.00	678.00
By traveling expenses	395.18	635.20
By contingent expenses	0.00	0.00
By buildings and land	165.80	14.55
By balance	0.00	0.00
Total	\$15,000.00	\$15,000.00

We, the undersigned, duly appointed Auditors of the Corporation, do hereby certify that we have examined the books and accounts of the Nevada Agricultural Experiment Station for the fiscal year ended June 30, 1919; that we have found the same well kept and classified as above; that the balance brought forward from the preceding year was \$0 on the Hatch Fund and \$0 on the Adams Fund; that the receipts for the year from the Treasurer of the United States were \$15,000 under the Act of Congress of March 2, 1887, and \$15,000 under the Act of Congress of March 16, 1906, and the corresponding disbursements \$15,000 and \$15,000, for all of which proper vouchers are on file and have been by us examined and found correct, leaving balances of \$0 and \$0.

And we further certify that the expenditures have been solely for the purposes set forth in the Acts of Congress approved March 2, 1887, and March 16, 1906, and in accordance with the terms of said Acts, respectively.

(Signed) D. J. SULLIVAN,

State Auditor.

Attest: C. H. GORMAN, Custodian.

REPORT OF THE DIRECTOR

S. B. DOTEN

RESOURCES OF THE NEVADA AGRICULTURAL EXPERIMENT STATION

The Nevada Station is supported almost wholly by two federal funds—the Hatch Fund (1887), \$15,000, and the Adams Fund (1906), \$15,000. In addition the Station has been greatly assisted by a small state fund amounting to \$1,000 per annum which made it possible to meet many needs not contemplated in the provisions of the two federal funds.

In the course of the last four years the purchasing power of the Station funds has greatly decreased. Meanwhile it has become necessary to pay higher salaries in order to retain valuable men; and it has been necessary to provide increased facilities for work and better quarters in which to conduct experimental studies. Both needs have been met. The methods by which this was made possible will be given in some detail.

In the first place, it has evidently become necessary to use the available funds only in direct connection with the actual needs of the projects. This has made it necessary to lay down clean-cut and definite plans for project work; to buy more carefully; to decrease expenditures for travel and for apparatus and equipment.

Sale of Apparatus and Equipment.

Meanwhile, in order to provide adequate laboratory facilities it seemed best to sell at war-time prices all superfluous apparatus and equipment, particularly that originally purchased for projects which have been finished. The Department of Meteorology had brought its studies of snow conservation and snow surveying to most important and successful conclusions. There appeared to be no other lines of project work in the Station for which the apparatus and other equipment of the Department of Meteorology could well be used. Nor did there appear to be a good prospect that this apparatus would prove useful in the immediate future. Meanwhile, the U. S. Reclamation Service had need of a strong sea-going launch for use in water measurements in the Lake Tahoe basin; and the Department of Engineering of the State of California needed instrumental equipment for the installation of snow surveys throughout the Sierra.

The Station therefore sold to the U. S. Reclamation Service the launch, Mount Rose, which had been employed in connection with earlier snow studies, obtaining \$500 from the sale. A nominal price of \$500 was also placed on the meteorological equipment for snow studies and snow surveying; and a sale to the Department of Engineering of the State of California was consummated. Dr. J. E. Church of the University of Nevada was made consulting engineer of the Department of Engineering in California and was given custody of the property sold by the Station. The U. S. War Department found difficulty in obtaining on short notice sufficient platinum to meet the

needs of the war. The Station had on hand a considerable quantity of platinum ware, for much of which substitutes could be readily found. Therefore 10.37 ounces of platinum were sold to the Federal Government at current market rates, netting a total of \$1,075.14. Another important sale was consummated in the disposal of the Hilger quartz spectograph, purchased earlier for the Department of Chemistry in the Station, to Cornell University for \$500. This instrument had been originally purchased for research work conducted by Dr. C. A. Jacobson, then head of the Department of Chemistry. The purchase proved to be scarcely wise, since very little use was ever made of the instrument. War-time conditions, however, made it possible to dispose of this piece of equipment at a price not far below the purchase cost.

Thus a total sum of \$2,575.14 was realized from the sale of superfluous apparatus and equipment, the larger part of which had been of great service to the Station. Throughout the year, moreover, the hide of every animal killed in experimental work was salvaged and sold. All superfluous animals were sold from the Station Farm and every possible measure of economy was used to increase the sales fund.

Meeting the Increasing Cost of Agricultural Research.

Another measure used in recent years to meet the increased cost of scientific work has been a reduction in the number of projects and lines of work to things plainly needed. That is, from the agriculture of the State, at the request of farmers and stockmen, we have picked out a number of problems of vital importance. These problems have been outlined as projects in the Station. The outline was made definite and simple and the work done has been carried on solely for the purpose of solving the problem. The change in policy made it necessary to eliminate certain projects of the highest scientific character whose agricultural connection was less evident. For example, the Station had maintained, from 1906 to 1916, a Department of Meteorology whose chosen field of work was the study of snowfall in the high Sierra. Snowfall is evidently the very life-blood of Nevada agriculture; but engineering methods must be used for the control of water running off from the great reservoirs of snow in the high mountains. As the Station's snow studies progressed it became more and more evident that they would contribute to engineering practice rather more definitely than to farm practice.

This statement cannot be construed as in any sense a criticism of the work itself, which was of the very highest character. But the evident tendency of the projects to give results which could be used only by foresters and engineers instead of by farmers made it clear that as soon as the work could be pushed to reasonable completion it must be replaced on the Station program by the study of problems more genuinely agricultural. Throughout the ten-year period mentioned, the snow studies were very generously financed; the fact that they were so supported gives evidence of a broad and generous attitude of the Office of Experiment Stations toward scientific work even when a little outside the scope of the funds. Evidently, however, with the reduced purchasing power of fixed funds, projects not founded upon actual agricultural problems must be eliminated.

Station projects which are working steadily toward useful results must be adequately financed, otherwise the progress of useful and

necessary projects and lines of work will be greatly hampered by unwise expenditures for things not so important or things not greatly needed. There is, of course, great need of close study in this matter, especially in the case of project work which has been long in progress.

Accounting in the Station.

Closely related to the problem of economy outlined above is the matter of accounting. Under present conditions it is absolutely necessary that the Station Director shall have constantly at hand a set of current accounts covering allotments to departments and projects and showing the daily progress of expenditure. In the absence of such a set of accounts with the departments of the Station, the annual budget of allotments becomes almost meaningless, since there is evidently no way of telling whether the expenditures bear any resemblance to the carefully made plan for expenditure, except in the matter of salaries.

There is kept in the Comptroller's office at the University an admirable set of current accounts under such prescribed headings as Salaries and Labor; Seeds, Plants and Sundry Supplies; Furniture and Fixtures, etc. Naturally, these ledger headings do not correspond to the allotments made to the departments of the Station in the annual budget where certain sums have been set aside for the Department of Range Management, others for Veterinary Science, Chemistry, Agronomy, and Entomology. Mr. C. H. Gorman, the University Comptroller, is an officer of the Station, receiving part salary from the Hatch Fund. The ledger headings for his accounts are schedules required by the U. S. Department of Agriculture, and as such are conscientiously observed. The prescribed system of accounting for the Hatch and Adams Funds used in the Comptroller's office is clearly of the utmost value in classifying the whole set of expenditures made each year by all the Stations.

For local administrative purposes, however, it is insufficient, because the administration of each station fund must be based directly upon expenditures classified according to departments and projects. In order, therefore, to administer the funds carefully, according to the annual budget and in a way to make every dollar go as far as possible, an additional set of books was opened at the close of the fiscal year in connection with the budget for the fiscal year 1919-1920. These accounts will be kept by Miss Hester Mayotte, Librarian and Station Secretary, and will be of great assistance in securing judicious and economical expenditure.

Some Beneficial Effects of Economy in the Use of Station Funds.

The economies resulting from the reduced purchasing power of the funds have not been without good effects upon the Nevada Station. We have found that if the work is to be done effectively with the expenditure of what is in effect far less money, then the following necessary conditions must be wisely conformed to:

In the first place, we have been obliged to base the work of the Station directly upon genuine problems in the agriculture of the State. Every project in the Experiment Station now represents a carefully planned attempt to solve by scientific means an important problem in Nevada agriculture. Every project has been taken up at the request of farmers and stockmen.

The project work is done according to plan. In the first place the scope of the work to be done is carefully thought out and limited.

We are now laying down for each year a working plan subject to constant revision as the experimental work develops. Plainly if the work is not proceeding according to a definite plan, then it is apt to wander aimlessly from point to point without being complete in any aspect; thus it may go on indefinitely for many years and finally be crowded out by the pressure of other needs, with little or nothing to show for the expenditure of many thousands of dollars. In this matter the direction which the work takes month by month is primarily important.

After the plans for project work for a given year have been carefully matured, then a financial budget is made, to provide for the carrying out of the plans. Quarterly reports upon the projects show the progress which has been made and the direction which the work should take for the following quarter. Both project plans and budget are kept flexible enough to provide for unforeseen needs and unexpected results from experimental work.

A current history of each project is kept in the Director's office, showing the origin of the project, the reasons for its study, its local importance, the relation of the work to that of other stations, and the like. The project history is based upon the quarterly and the annual reports of the Station departments. This gives a check upon the relation of work done to work planned and upon the progress of the project toward completion.

Clearly, since many projects are based upon problems touching various departments of the Station, few projects can be regarded as belonging exclusively to any given department. The problems are problems of the State's agriculture, the projects are projects of the whole Station, not of any single department. Since, however, a project may well originate in one single department and yet may need for its solution the work of several sciences, it is evident that it will be best to hold the head of one department responsible for leadership in the work. For example, in Project 22, Poisonous Range Plants, Adams Fund, Nevada Station, the head of the Department of Range Management, C. E. Fleming, is the project leader; but studies of the effects of poisonous plants upon animals naturally concern the Department of Veterinary Science almost as much as that of Range Management. Leadership in the experimental work is therefore vested in Mr. Fleming; the feeding experiments are largely planned by him; but in the observation of symptoms and post-mortem effects he is constantly assisted by Dr. Lewis H. Wright and by assistant veterinarians. Still, the chemistry of poisonous plants is of great importance in any complete study of the matter; for which reason the Station Chemist, Mr. M. R. Miller, spends the greater part of his time in separating out the poisonous matter from such plants and determining its chemical character.

On the whole, the financial difficulties into which the Nevada Station has fallen, in common with other stations in recent years, have led directly toward the requirement that the experimental work done shall be vitally needed, that lines of experimental work which do not prove fruitful shall be discontinued within a reasonable time and replaced by things more greatly needed or evidently more possible of accomplishment, that the work shall be planned in advance and done

according to plan, that the budget shall be based directly upon the project plans, and that throughout the year accounts shall be kept in the Director's office which will show the monthly progress of expenditure; and, finally, that the projects must be regarded as the projects of the entire Station in which several or all departments will share.

Beyond all this, there is evidently an opportunity for economy and added effectiveness in cooperative work among the stations. It is often out of the question for a single station to cover the entire ground needed for the solution of a single problem. There are very few problems so wholly local that they are not agricultural problems in several adjoining States or States with similar climatic conditions. This is preeminently true in animal diseases; it is almost equally so in questions of irrigation practice, dry-farming, poisonous plants, variety testing of grains, and a host of other problems.

In the matter of equine anemia, a disease occurring in a number of States and in various countries, it would seem to be very highly desirable for all the stations interested to share in the study of the problem. First of all, it would be necessary to work out improved methods of diagnosis; then, when it was positively established that all the stations cooperating were actually working upon the same disease, it should not be difficult to divide up the problem into component parts. One station might then specialize in the study of the bacteriology of the disease, another could work more largely upon the transmission of the disease by biting-flies, a third station might give special study to transmission by contaminated food and water, a fourth could work upon the use of vaccines and serums or upon refinements in methods of diagnosis.

In precisely the same way several stations could work upon a poisonous plant growing in adjoining States. One station might be better equipped than another for the study of the botanical and ecological relationships of the plant—all could share in the study of its local distribution. A second station might have excellent facilities for the study of the effects of the plant upon experimental animals. A third might be better equipped than the others for the chemical study of the poisonous elements found in such plants.

Such cooperation would necessarily require comprehensive and intelligent joint planning; it would be necessary for the workers to meet at least once a year to report upon progress made, and to plan for further work. In the long run such cooperative work by a number of stations could hardly fail to result in substantial economies and in added progress.

Improvements in the Station Building.

The sale of apparatus and equipment no longer useful to the Station made available a considerable sum of money with which improvements greatly needed have been made. The space actually occupied by the Station in the Hatch Building was also greatly increased. Upon the completion of the new Agricultural Building Dr. Romanzo Adams of the Department of Economics was assigned new offices and classrooms in Stewart Hall. This released a considerable amount of floor space which was refitted as a workroom in Entomology. Through the cooperation of President Clark, room was assigned in Morrill Hall for Dr. Church's meteorological studies; this set free the entire top floor

of the Hatch Building; and the space was immediately used for the equipment of a botanical laboratory for the Department of Range Management.

The excellent herbarium of range plants, collected between 1900 and 1913 by Messrs. Kennedy and Heller of the former Department of Botany, Horticulture and Forestry, was transferred to the new botanical laboratory in Range Management. The herbarium cases were thoroughly repaired, new shelving was fitted to many of them, and the entire herbarium was gone over by Mr. Peterson of the Department of Range Management and put in readiness for daily use. Large tables, a microscope bench, storage lockers, bookcases, and the usual laboratory furniture completed the equipment of this laboratory. The entire building was then rejuvenated. The walls were kalsomined, the plaster repaired, the stairways carefully repaired, hall linoleums laid, a linoleum put down in the entire botanical laboratory, matters of plumbing and wiring taken care of, and the entire building was put into shape for convenient daily use in scientific research.

At the best, however, the Hatch Building is not modern nor well suited for its present purposes; there is an unavoidable fire danger and the limit of expansion has been reached, since every corner of the building is now in use. The Department of Veterinary Science is already crowded for necessary space; the hoped-for growth and progress of the Department of Range Management will call for facilities of a different character. It is to be hoped that before many years the present Station Building will be replaced by a larger structure carefully planned to fit its purposes.

LIST OF ACTIVE PROJECTS, 1918-1919

Project 1. Irrigation Experiments. Hatch Fund, 1914-1919. Project Leader—C. S. Knight.

The extension of agriculture in Nevada depends primarily upon the use which is made of a limited water supply in irrigation. The purpose of this project during its five seasons of existence has been to determine the conservative water requirements of the principal crops grown in Nevada.

In the beginning, in outlining the project Dean Knight assumed that there are certain stages in the growth of each of these crops at which water is far more necessary than at other stages. In the course of five years study it has been shown that there are such critical stages in the growth of the wheat plant and in other grains. It has also become evident that the alfalfa plant and other leading crops show by their general appearance and the color of the foliage when they are in need of water. The tests have shown likewise that the best rule for irrigation is to give sufficient water at a time when the plants themselves show that they need water. As a result of experiments conducted under this project, the Department of Agronomy in the Station has learned in what way wheat, alfalfa, and other crops show the need of water; at what stages of growth water is most needed; how much water should be applied under average conditions to give the most profitable yields; and how to obtain the highest crop yield from a limited water supply.

The results obtained apply best, of course, to those conditions of

soil and climate under which the experiments were conducted, still the results were not in any way confused by rainfall during the summer months; and the soil chosen is a fair representative of the average soil conditions in Nevada.

The crop yield per acre of land in this State is of far less importance than the yield per acre-foot of water; and, as practically all our agriculture is dependent for its existence upon irrigation, it is evident that studies of methods of obtaining the greatest possible yield from the existing limited supply of water are of fundamental importance to the State.

Project 2. Variety Testing and Crop Improvement. Hatch Fund, 1914-Continuous. Project Leader—C. S. Knight.

It is, of course, of great importance to grow the varieties of wheat, alfalfa, potatoes, and other crops which will give best returns for their cost in labor, land, and water. There are very many varieties of every crop and for many years past the Station has had leading varieties under test. In Dean Knight's variety testing he has done away with a great many varieties tested earlier and has confined his efforts to the testing of a few which are essentially promising. This work has thrown a great deal of light on the conditions under which high-gluten wheats may be produced for milling purposes; and it has shown the strains of alfalfa, wheat, barley, corn, corn for ensilage, and potatoes which are best adapted to the climate of western Nevada.

Project 25. Methods of Increasing Hay Production in the Humboldt Valley. Hatch Fund, 1919-1924. Project Leader—C. S. Knight.

This project was outlined prior to the beginning of the fiscal year and the study was planned as a project to be carried on jointly by the Nevada Agricultural Experiment Station and the Bureau of Public Roads and Rural Engineering of the U. S. Department of Agriculture. A suitable location for the studies was found near Battle Mountain, Nevada; and during the summer Mr. George Hardman of the Department of Agronomy of the Nevada Station did active field work upon the problem. The purpose of the project is indicated by the title, and it is hoped that, as an outcome of the work, methods of irrigation and crop production may be found which will result in increasing the yield of hay from the Humboldt meadowlands—probably the most important agricultural region in the entire State.

Project 23. Revegetation of Depleted Ranges. Hatch Fund, 1916-Continuous. (Consolidating Projects 7, 8, 9 and 10, Hatch Fund.) Project Leader—C. E. Fleming.

The purpose of this project is made clear by the title. The acute need of studies of this type becomes evident only when the student travels far over the sheep and cattle ranges in Nevada and observes their present condition. All work which has been done on this project points clearly to the fact that the cause of the present bad condition of Nevada ranges lies in the lack of regulation and control. Where the public range lands lie open and free to all comers it is to each man's interest to secure as much as possible from the range for him-

self without regard to others or to the future. Our revegetation studies have shown that there is practically no hope of doing anything for the sheep and cattle ranges of the State except under official regulation and control. If the open public ranges in Nevada were placed under federal administration, it would be easily possible so to regulate grazing that the supply of palatable forage would steadily increase, the carrying capacity would become much greater, and from Nevada's ranges there would be turned off each year an increasing number of sheep and cattle.

Project 24. Methods of Increasing the Percentage of Lambs in Nevada Flocks. Hatch Fund, 1919-1921. Project Leader—C. E. Fleming.

The title chosen for this project does not indicate its full scope. Mr. Fleming plans in the future to study methods of producing better lambs as well as more lambs. The bad condition of the sheep ranges has made it necessary to feed hay to lambing ewes to an increasing extent. Under this condition lambs do not thrive as well as has been expected, and the question of a suitable ration of the right feed for lambing ewes is intimately connected with this project.

In the coming fiscal year the Station plans to study the effect of various feeds available in Nevada upon the milk supply of lambing ewes.

Project 15. Equine Anemia. Adams Fund, 1908-Continuous. Project Leader—Edward Records.

This project has been active in the Nevada Station for a great many years. In recent years, however, the disease has decreased considerably in local importance, and, since no very definite results have come from the project, there is good reason to believe that it will soon be necessary to discontinue this line of work in favor of other studies of a more profitable character. In the course of the fiscal year, however, Dr. Lewis H. Wright of the Veterinary Department has made progress in the diagnosis of equine anemia and in the study of other diseased conditions in horses which it closely resembles.

Project 16. Hemorrhagic Disease in Cattle. Adams Fund, 1914-Continuous. Project Leader—Edward Records.

This disease has remained almost as mysterious as it was in 1914, when it first came under study. Its cause is still unknown. Dr. Records has made surprising progress in the treatment of the disease in view of the fact that so little has been discovered concerning its origin. It is at present not entirely clear that the disease is actually caused by bacteria or other micro-organisms. This point will be investigated more fully hereafter.

Project 18. Contagious Epithelioma in Fowls. Adams Fund, 1914; Hatch, 1916-Continuous. Project Leader—Edward Records.

In past years one of the serious obstacles to the growth of the poultry industry in western Nevada has been the prevalence of a disease known as "contagious epithelioma."

This disease has been under study in the Nevada Station since 1914, and methods of treatment have been worked out so successfully that they have been widely adopted in other States.

In the current fiscal year, however, very few outbreaks occurred and there was little opportunity for further study.

Project 19. Biting-Flies of Cattle. Adams Fund, 1916-1921. Project Leaders—
R. W. Wells, U. S. D. A., and S. B. Doten.

In various parts of Nevada, horse-flies and other biting-flies have proven to be a serious source of annoyance to cattle on high pasture lands.

In 1916 the problem was started as a project to be studied jointly by the Bureau of Entomology of the U. S. Department of Agriculture and the Nevada Station. The habits and breeding places of the flies were very carefully worked out; and in the course of the present year it became evident that the flies do not breed in cultivated ground, but breed only in badly drained and swampy lands. There is every reason to believe that nothing but the reclamation of such lands through drainage and cultivation will put an end to the biting-fly nuisance. This project will probably be terminated in the coming fiscal year, and written up for publication.

Project 20. White-Sage Studies. Adams Fund, 1916-Continuous. Project Leader—C. E. Fleming.

Studies of the habits of the white sage (*Eurotia lanata*) and the conditions under which it grows and reproduces have shown that this valuable plant must be protected and given an opportunity to reproduce and be guarded against overgrazing unless it is to disappear as many another western range plant has practically disappeared.

Nothing short of additional legislation for the control and wise administration of the unprotected public grazing lands of Nevada will prevent the destruction of the white-sage ranges. The study of this plant will be continued until conservative methods of handling white-sage ranges have been worked out.

Project 22. Poisonous Range Plants. Adams Fund, 1916; Hatch, 1918-Continuous. (Consolidating Project 6, Hatch, and Project 14, Adams.) Project Leader—C. E. Fleming.

Throughout the State of Nevada there is a growing demand for information concerning range plants poisonous to sheep and cattle. This is very evidently due to the fact that when the palatable and nutritious grasses and browse have been eaten out and destroyed there is practically nothing left for the cattle and sheep except the unpalatable poisonous plants. Poisoning is very apt to occur and to increase among hungry animals on ranges where there is little grass, although, ordinarily, poisonous plants would go untouched or would be merely nibbled or eaten in quantities too small to produce death. In the work upon this project Mr. C. E. Fleming, assisted by N. F. Peterson, has studied the habits of growth of various poisonous plants, the conditions under which they grow and spread, and the conditions under which poisoning occurs. They have fed suspicious plants to sheep and cattle in order to determine whether or not they are poisonous. Dr. Lewis H. Wright of the Department of Veterinary Science has shared in this work by conducting autopsies on dead experimental animals and by making careful observations of the symptoms shown

by poisoned animals. Meanwhile, Mr. M. R. Miller, head of the Department of Chemistry in the Station, has isolated the active poisonous principles from several of the plants, and his work has been of great assistance toward the success of the project. Work upon this project will probably continue for several years more.

BULLETINS PUBLISHED DURING THE YEAR

Bulletin 95. Range Plants Poisonous to Sheep and Cattle. July, 1918. By C. E. Fleming. Spanish Translation by B. F. Schappelle.

At the time this bulletin was printed there was an increasing demand for information concerning poisonous range plants. The experimental feeding tests which later became so important a feature of this project had scarcely been started. Because of the war-time situation, however, it seemed best to gather together all existing information concerning range plants known to be poisonous in Nevada, and to issue this information in popular form as promptly as possible. An illustrated bulletin of fifty pages was therefore prepared. The work was based upon field observations and laboratory experiments made by Messrs. Fleming and Peterson. Colored illustrations were used to depict six of the most important poisonous plants. In addition twenty-three drawings and photographs were used to show the characteristics of plants known to be poisonous and to illustrate safe and unsafe methods of handling sheep on the range. In order to make the information contained in this bulletin immediately available to sheepherders, the Station issued a clear and simple Spanish translation by Dr. B. F. Schappelle, then Assistant Professor of the Romanic Languages and Literatures in the University.

Bulletin 96. Irrigation of Field Crops in Nevada. By C. S. Knight and George Hardman.

Nothing is more evident in Nevada agriculture than the need of getting the highest possible crop yield from the very limited supply of available water. Every extension of acreage depends strictly upon the ability of Nevada farmers to make water go a little farther in crop production. In many States the yield per acre is the index to successful farming. In Nevada the yield per acre is of less importance than the yield per acre-foot of water. In Bulletin 96, Dean Knight and his assistant, Mr. George Hardman, have brought together the results of five years experimental study in the irrigation of alfalfa, wheat, potatoes, sugar-beets, and other crops.

During the five-year period, 1914-1918, the summer rainfall was too small to affect the moisture in the soil. The variations in crop yields in these experiments were therefore directly due to variations in the amount of water applied. The most economical use of water with alfalfa was brought about by a total irrigation of 3.5 feet of water applied when the plants showed the need of water by the dark-green color of the foliage. With 3.5 feet of water, 5.59 tons of alfalfa were grown per acre. With 6.3 feet of water, 6.18 tons were produced. It is evident that the increased yield cost altogether too much in water applied.

The experiments with wheat showed that the yield fell off worst when irrigations were omitted at the boot and bloom stages. This showed plainly that the period between the boot and milk stages is a

very critical period in the irrigation of wheat. Experiments indicated that clover should not be allowed to wilt before water is applied. With sugar-beets the tests made it evident that the greatest yield for the amount of water applied could be obtained with 18 inches of water applied in three 6-inch applications.

The results of all these experiments, of course, apply most directly to conditions in western Nevada. In order to make them of greatest value it will be necessary to carry them on as demonstrations throughout the State.

Bulletin 97. Don't Feed Fox-Tail Hay to Lambing Ewes. August, 1919. By C. E. Fleming and N. F. Peterson.

In connection with Project 24, Hatch Fund, Methods of Increasing the Percentage of Lambs in Nevada Flocks, Mr. Fleming and Mr. Peterson have begun active studies of available feeds, which will produce the most abundant milk-flow in ewes after lambing. An incident, which



Figure 1. Sheep eating hay containing Fox-Tail. When fed such hay in feed-racks the sheep are very apt to be blinded.

occurred at a point in western Nevada in the spring of 1919, showed that certain kinds of hay commonly fed are not only valueless, but are often highly dangerous.

Timothy hay has proven to be of very little value, and in the case in question the feeding of timothy and alfalfa hay contaminated with fox-tail led to the death of several hundred sheep. Ewes were fed a poor quality of mixed timothy and alfalfa hay containing a great deal of fox-tail. In a little while a number of deaths occurred; and soon outside the corral fence there were several hundred skinned carcasses.

The sharp bearded seeds penetrated the soft tissues of the mouth, becoming imbedded in the gums and setting up such soreness that the teeth became loose and the animal ceased to feed. In a great many cases the bearded seeds penetrated the eyes of both ewes and lambs, causing

blindness. The seeds caught in the wool of the face and bored into the skin and caused abscesses. In other instances abscesses in the ear were due to the same cause. This was the most extreme case of fox-tail injury which ever came to the attention of the Nevada Station. Mr. Fleming and Mr. Peterson, assisted by Drs. Records, Wright, and



Figure 2. A lamb blinded by Fox-Tail in hay. Several abscesses on the face are due to the same cause.

Louck, and Dr. Robert Dill, Inspector of the State Board of Sheep Commissioners, examined a large number of cases and obtained the best possible records of the exact character of the injury done.

The observations and notes were so complete and of so much value that they were published as Bulletin 97 and illustrated by a series of twelve original photographs.

DEPARTMENT OF AGRONOMY

C. S. KNIGHT

PROJECT 1—IRRIGATION EXPERIMENTS**Irrigation Experiments with Alfalfa and Wheat.**

The object of this investigation was to determine the critical stages in the irrigation of each crop and to show at what stages of growth the plants are best able to be deprived of an application of water without causing serious injury to the crops; also to determine the amount of water required for the greatest production, and the production with small applications at different stages. With alfalfa a comparative study was made of the plants at different stages of growth with different methods of irrigation to determine the proper stages at which to irrigate these crops, and the proper amount of water to use at each application for the best results. With wheat the object was to determine at which stage or stages of growth an application of water may be eliminated without greatly affecting the yield of grain, and to determine whether or not two applications of water prove as effective as three or more applications with the same amount of water used.

This is the fifth and concluding year of the series of irrigation experiments, and the results of this work are discussed in detail in the the recent Bulletin No. 96 on the Irrigation of Field Crops in Nevada.

Irrigation Investigations with Alfalfa, 1915-1918.

During the four-year period, 1915-1918, experiments were conducted on the irrigation of alfalfa to compare the depth of application, water content of plant, proportion of leaves to stems, yield per acre, and yield per acre-foot of water, when irrigated at different stages of wilting.

In these experiments the water was measured into the plats through two-inch galvanized iron pipes and check plats were used to eliminate as far as possible any variation in soil. The alfalfa was irrigated by the border method of flooding, using small furrows about three feet apart to provide a more ready channel for the water to the lower ends of the plats. The head of water was so regulated as to prevent any run-off. The results herein recorded are, therefore, based upon the actual water used by the plats under the varying conditions presented.

Alfalfa that was allowed to reach the wilting point before irrigation produced a relatively low yield per acre, but excellent returns were realized when irrigation was withheld until the plants turned dark-green in color.

The most economical use of water with alfalfa was accomplished with a total irrigation of 3.5 feet applied when plants showed need of water by dark-green color of foliage, producing 5.59 tons per acre, or at the rate of 1.67 tons per acre-foot of water. Soil-moisture determinations showed that 70% of the six-inch applications was retained in the first four feet in depth of soil. The use on this plat was equivalent during the period of irrigation to a delivery of water at the rate of 1 second-foot for 85 acres, or 0.47 miner's inch per acre.

The highest yield of 6.18 tons per acre of alfalfa was obtained with

a total irrigation of 81 inches when the crop was irrigated before plants showed need of water, but this was accompanied by the lowest yield of 1.03 tons per acre-foot. Compared with the yield of 5.59 tons per acre, the increase of 0.6 ton was obtained at the expense of an additional use of 39 inches of water, which was at the rate of 0.18 ton per acre-foot. Soil-moisture determinations showed that only 25% of the 12-inch applications was retained in the first four feet in depth of soil.

In the irrigation of alfalfa the decrease in soil-moisture content at harvest was generally greatest with the 9- and 12-inch applications. The total amounts of water held in the soil were greatest with the last two stages of wilting.

Results of Irrigation Investigations with Wheat.

The irrigation experiment with wheat included sixty plats. The plats were 22 feet wide by 165 feet long and were separated by levees 4 feet wide. Marquis wheat was used. The seed was not treated, but no smut appeared. It was seeded with a drill, April 4, at the rate of 75 pounds of seed per acre. The plats were harvested during the last week in July with a grain binder. The plats first to ripen were those where two irrigations were omitted, one of which was at the bloom or the milk stage. A four-foot cut around the outside portion of each plat was eliminated to prevent as far as possible any variation due to seepage from adjacent plats.

In the irrigation of wheat during the five-year, 1914-1918, 3- and 7-inch applications were given at two or more of the five stages of growth, including five-leaf, boot, bloom, milk, and dough stages.

Comparison was made of plats receiving an irrigation at each of the five stages of growth with plats in which (1) an irrigation was omitted at each of the five stages of growth; (2) with plats in which irrigations were omitted at any two of the five stages; and (3) with plats that received the same amount of water in two applications, one before and one after heading.

The highest yield of wheat was obtained with 28 inches of water in four applications, when an irrigation was omitted at the five-leaf stage.

The highest yield of wheat with three irrigations occurred with 21 inches of water when applications were omitted at the five-leaf and dough stages.

The average yields of wheat were considerably higher with the 7-inch than with the 3-inch applications.

The yields of wheat were relatively low when irrigations were omitted at the boot and bloom stages, thus indicating that a very critical period in the irrigation of wheat was between the boot and milk stages.

The highest yield of wheat with two irrigations was secured with 9-inch applications, one before and one after heading.

In the irrigation of wheat the high yields per acre were generally accompanied by the greatest decrease in soil-moisture content at harvest as compared with the soil-moisture content before the first irrigation.

Weather Conditions.

The precipitation record for the past year shows a total rainfall slightly above the average. Very little of this rainfall was received

during the growing season, the greater part occurring in the months of February, March, September, and October. The precipitation in May of 0.25 inches was not sufficient to influence the results of this experiment. The rainfall in September occurred after the crops were harvested.

PROJECT 2—VARIETY TESTING AND CROP IMPROVEMENT

These experiments included row and plat tests of several important varieties of wheat, oats, barley, potatoes, ensilage crops, and beans, the object being to determine the varieties of these crops which show special adaptation to the local conditions by their hardiness and yielding capacity; and to improve these varieties by selection. By testing out these varieties in various parts of the State where altitude and climatic conditions are different it will be possible to determine the highest-producing varieties of cereals and forage crops for the various agricultural districts of the State.

Cereals, Row Tests.

The experiment with varieties of wheat, oats, and barley included 17 varieties of wheat, 15 of oats, and 17 of barley. Each variety was represented by one row 100 feet long. The seed was planted $1\frac{1}{4}$ inches deep in rows 1 foot apart. The yields of the fifteen highest-producing varieties were as follows:

WHEAT

Variety	Yield per acre of grain, in pounds						Bushels, average
	1914	1915	1916	1917	1918	Average	
1 White Club	3,294	3,095	3,856	1,912	2,588	2,948	49.2
2 Galgalos Fife C.I. No. 2398	4,482	3,471	2,812	2,812	994	2,942	49.0
3 New Zealand	2,896	4,087	3,040	1,349	2,870	2,870	47.8
4 Defiance	3,023	3,857	2,580	1,949	2,892	2,892	47.5
5 Colorado No. 50	2,780	3,425	3,422	2,821	1,494	2,824	47.1
6 Chul	3,222	3,145	2,879	2,858	1,897	2,794	46.6
7 Marquis	2,808	3,505	2,979	2,608	1,899	2,759	46.0
8 Bluestem	3,318	2,855	3,856	1,898	1,885	2,750	45.8
9 White Australian	816	3,259	4,052	2,713	2,587	2,693	44.8
10 Stanley White	2,724	2,667	2,554	3,185	1,918	2,609	43.5
11 Festes C.I. No. 1596	2,534	3,304	3,262	1,140	2,553	2,553	42.6
12 Minnesota No. 163	2,692	3,365	2,071	1,890	2,505	2,505	41.7
13 Glyndon	2,274	3,935	1,937	1,785	2,483	2,483	41.4
14 Minnesota Fife	2,100	3,643	2,978	2,212	1,394	2,465	41.1
15 Rieti	2,190	2,842	2,934	1,281	1,663	2,381	39.7
16 Marquis*	2,190	2,842	2,934	1,281	1,976	2,254	37.4

*Average of checks.

The yields of wheat were low for 1918 owing to the fact that the seed was sown by hand, with a resulting thin stand. A new hand-planter was purchased and used for seeding the oats and the barley, but did not arrive until after the wheat had been seeded.

Of the varieties grown for five years, White Club was the highest producer with 2,949 pounds per acre. The next four highest-yielding varieties in the order named were: Colorado No. 50, Chul, Marquis, and Bluestem; the greatest difference in yield being 74 pounds, Marquis producing 192 pounds less than White Club. Likewise with the next three varieties in order of yield, including White Australian, Stanley White, and Minnesota No. 163, the greatest variation in yield was 228 pounds.

Marquis and Bluestem varieties produce a high quality of wheat for milling and command an excellent market in the local mills, replacing the hard winter wheat previously shipped in from other States. This superiority in quality of grain more than offsets the difference in yield between them and the three highest-yielding varieties. Marquis has maintained its hardness after growing five years under irrigation.

Of the varieties grown for four years, Galgalos Fife is the highest producer, with New Zealand and Defiance following closely in yield. The yield of Galgalos Fife has been decreasing each year, and averages less than that of White Club.

OATS

Variety	Yield per acre of grain, in pounds						Bushels, average
	1914	1915	1916	1917	1918	Average	
1 Early Mountain No. 2 C.I. 656		2,185	3,042	3,301	1,516	2,511	78.5
2 Early Mountain C.I. No. 754		2,041	2,187	2,380	1,672	2,070	64.8
3 Black American		1,844	1,937	2,694	981	1,864	58.2
4 Siberian C.I. No. 741		2,054	1,222	3,018	801	1,774	55.5
5 Banner C.I. No. 751		1,922	1,863	1,965	935	1,669	52.1
6 Big Four	813	1,895	1,614	2,524	995	1,568	49.0
7 White Danish		2,011	1,308	2,135	799	1,563	48.9
8 Garton C.I. No. 752	663	2,223	1,340	2,492	936	1,531	47.9
9 Colorado Black	640	1,975	1,412	2,338	1,254	1,524	47.6
10 Danish	1,124	1,678	1,494	2,190	985	1,494	46.7
11 O.A.C. No. 72		1,847	1,055	1,893	813	1,402	43.8
12 Siberian Nevada	788	2,084	1,441	1,578	1,053	1,385	43.3
13 Wisconsin Fed. No. 1	1,060	1,950	1,161	1,635	655	1,292	40.3
14 Kherson	1,425	1,658	994	1,523	832	1,286	40.2
15 Abundance*	692	1,656	982	1,869	745	1,189	37.2

*Average of checks.

Of the varieties tested for four years, Early Mountain was the highest producer, with 2,511 pounds or 78.5 bushels per acre, which is about 35% greater than that of any other variety. This variety was affected less than any other by shattering of seed due to blasting of the panicles before the grain had ripened. Early Mountain seed is being sent to different parts of the State, to be compared with the varieties commonly grown in these districts.

BARLEY

Variety	Yield per acre of barley, in pounds						Bushels, average
	1914	1915	1916	1917	1918	Average	
1 Swedish Gold 2-row			4,763	4,879	2,594	4,078	84.6
2 Princess 2-row		2,012	4,352	2,089	5,154	3,889	70.4
3 Trebi 6-row		2,197	3,896	2,813	3,456	3,088	64.3
4 Chevalier 2-row	2,720	2,680	3,625	2,594	3,482	3,016	62.8
5 Blue Ribbon 2-row	3,040	3,443	4,025	667	3,433	2,920	60.8
6 Moravian 2-row	3,086	2,502	3,294	2,376	3,244	2,900	60.4
7 Heils Hamma 2-row	3,023	1,650	4,166	2,791	2,900	2,866	59.7
8 White Smyrna 2-row	2,395	2,522	4,667	2,040	2,544	2,834	59.0
9 California Feed 6-row	2,367	2,814	3,975	2,547	2,483	2,837	59.0
10 C.I. 679 France 2-row	1,469	3,260	4,924	1,773	2,635	2,812	58.6
11 Hamma 2-row	1,618	3,340	3,991	2,134	2,854	2,787	58.5
12 Brewing (Wash.) 6-row		3,125	3,823	1,846	2,374	2,792	58.0
13 New Zealand 2-row		2,740	4,917	486	2,956	2,775	57.8
14 Oregon 19785 2-row	1,465	2,784	4,314	2,766	2,275	2,711	56.5
15 White Moravian 2-row	3,315	1,661	3,432	2,522	2,397	2,645	55.1
16 Manchuria* 6-row	1,325	1,867	2,804	1,820	2,968	2,177	45.3

*Average of checks.

Of the varieties tested for five years Chevalier was the highest producer, with 3,016 pounds per acre. Closely following, with yields of 2,920 and 2,900 pounds, respectively, were Blue Ribbon and Moravian. Swedish Gold, a 2-rowed variety, introduced in 1916, heads the list of high producers, with an average of 4,078 pounds. This variety has a very short straw, thus making it difficult to save all the grain with the binder, which condition will prevent its introduction on a commercial basis. The tremendous yield of Princess for 1918 of 5,154 pounds brings this variety into second place with an average of 3,389 pounds. It is interesting to note that of the first eight high producers, with the exception of Trebi, all are 2-rowed varieties.

Cereal Plat Tests

A number of the highest yielding grains in the row variety tests were grown in plats to compare their behavior and yielding power under these conditions. The results with wheat, oats, and barley for the past three years are given in the following tables:

WHEAT

Variety	Yield per acre, in pounds				Bushels, average
	1916	1917	1918	Average	
1 White Club.....	3,331	1,951	1,788	2,356	39.3
2 Rieti.....		2,195	1,958	2,086	34.5
3 Marquis.....			1,955	1,955	33.1
4 Minnesota No. 163 [*]	2,495	1,932	1,459	1,972	32.9
5 New Zealand.....			1,459	1,459	24.3
6 Galgalos Fife.....		968	1,753	1,340	22.8
7 Defiance [†]			1,239	1,239	20.7

*Average of checks. †Reseeded May 4, 1918. Plats 11x264.

In this experiment White Club made the highest average yield of 39.3 bushels. Rieti, Marquis, and Minnesota No. 163 followed in order with little variation in yield. Owing to a poor stand of Defiance, this plat was reseeded. This was partly responsible for the low yield.

OATS

Variety	Yield per acre, in pounds				Bushels, average
	1916	1917	1918	Average	
1 Early Mountain No. 2.....		1,251	1,279	1,265	39.5
2 Abundance.....		1,420	433	926	28.9
3 Great Dakota.....	1,125	948	626	899	28.1
4 Siberian C.I. No. 741.....			718	718	22.4
5 Wisconsin Ped. No. 1.....	884	357	553	631	19.7
6 Kherson.....	504	171	304	326	10.2

Seeded April 15, 1918. Plats 11x264.

In this test Early Mountain No. 2 was the only variety not badly affected by shattering of the grain. Little variation is noted in the yields of this variety for the two years.

BARLEY

Variety	Yield per acre, in pounds				Bushels, average
	1916	1917	1918	Average	
1 Chevalier.....	2,858	1,811	1,796	1,968	41.4
2 California Feed.....			1,972	1,972	41.4
3 Moravian.....	2,720	1,289	1,839	1,949	40.6
4 New Zealand.....			1,609	1,609	33.5
5 Blue Ribbon.....			1,544	1,544	32.2
6 Swedish Gold.....			1,022	1,022	21.3

Seeded April 15, 1918. Plats 11x264.

In this test Chevalier, California Feed, and Moravian were the highest producers, in the order named, with but little variation in yield. The relatively low yield of Swedish Gold was due chiefly to the loss of grain in binding caused by the shortness of the straw.

Forage Crops and Potatoes

ALFALFA

Average Results, 1917-1918

Variety	Leaves, per cent of plant		Yield per acre, in tons		
	First crop	Second crop	First crop	Second crop	Total
1 North Dakota.....	37.9	38.1	2.97	3.02	5.99
2 Australian 23753.....	27.7	36.6	3.38	2.52	5.85
3 Baltic.....	40.0	39.8	2.72	2.35	5.07
4 Nevada 88.....	37.3	37.4	2.49	2.50	4.99
5 France 24928.....	42.9	38.4	2.61	2.27	4.88
6 Grimm.....	39.4	40.5	2.75	2.12	4.87
7 Nevada*.....	38.3	39.3	2.42	2.44	4.86

*Average of checks. Plats 22x110.

Of the seven varieties included in this experiment North Dakota 27247 shows the highest yield of 5.99 tons per acre. With the exception of the check plats Grimm has the lowest yield of 4.87 tons per acre. Little variation occurred in percentage of leaves to stems, Australian 23753 was lowest with an average of 37.1%, while France 24928 was the highest with 40.6%.

ENSILAGE CROPS

Variety	Yield per acre, in pounds		
	1917	1918	Average
Russian sunflower.....	48,240	39,852	43,046
Improved Leaming corn.....	28,422	26,085	27,258
Sudan grass.....	4,977	8,630	6,803

This test included Russian sunflower, Improved Leaming corn, and Sudan grass. Three plats of Marquis wheat were grown as checks. Both corn and sunflower reached the proper stage for ensilage early in September. The yields of sunflower for the two years, 1917 and 1918, averaged 43,046 pounds, while the yields of corn averaged

27.258 pounds. Moreover, the sunflower matured to the proper stage for silage before danger of frost, whereas immature corn was harvested each year for silage.

SUDAN GRASS FOR SEED

Variety	Yield per acre, in pounds				
	1915	1916	1917	1918	Average
Sudan grass.....	1,099	1,912	642	552	1,051

An average of the four years shows a production of 1,051 pounds of Sudan-grass seed. As nearly as could be estimated one-half of the 1918 yield was destroyed by birds while the seed was in the dough stage. The Sudan grass was sown in drill rows about thirty inches apart and cultivated to keep down weeds and conserve moisture. It was harvested when the first heads were fully ripe.

BEANS FOR SEED

Variety	Yield per acre, in pounds					
	1914	1915	1916	1917	1918	Average
California Large Mexican Pinto.....	540	296	679	.....	681	549

The California Large Mexican Pinto is a bush bean that has been grown for five years with an average production of 549 pounds to the acre. It is a good thrifty grower, a heavy producer, and is valuable as a string bean, but only during a short period of growth. As a dry bean it is unexcelled in flavor and food value.

POTATOES

Variety	Yield per acre, in pounds							Bushels, average
	1913	1914	1915	1916	1917	1918	Average	
1 Great Divide.....	21,700	13,025	6,169	7,750	19,068	19,177	14,484	241.4
2 Burbank*	16,620	10,027	8,096	5,931	24,379	18,221	13,862	231.0
3 Peerless.....	18,460	6,152	6,438	6,516	21,344	20,965	13,816	221.9
4 Early Russet.....	19,220	3,562	7,327	4,579	13,387	14,844	10,570	176.1
5 Early Red.....	12,160	4,222	5,979	3,954	14,232	8,142	8,115	135.2
1 White Rose.....	.....	.....	.....	.....	23,371	28,223	25,797	429.9
2 Producer.....	.....	.....	.....	.....	23,463	26,264	24,863	414.4
3 Pride of Multnomah.....	.....	.....	.....	.....	16,399	26,590	21,744	382.4
4 American Wonder.....	.....	.....	.....	.....	21,634	19,770	20,702	345.0
5 Jones Russet.....	.....	.....	.....	.....	19,699	18,434	18,566	309.4
6 Snow—Oregon.....	.....	.....	.....	.....	9,090	19,653	14,371	239.5
7 Snow—California.....	.....	.....	.....	.....	12,438	14,778	13,608	226.8
8 Early Prizetaker.....	.....	.....	.....	.....	11,737	12,293	12,015	200.2
9 Scotch Rose.....	.....	.....	.....	.....	11,636	9,949	10,792	179.9
10 Burbank—Oregon.....	.....	.....	.....	.....	10,169	10,388	10,278	171.3
11 Netted Gem.....	.....	.....	.....	644	11,750	12,301	10,164	169.4
12 Melothian.....	.....	.....	.....	.....	5,636	8,320	6,978	116.3

*Average of checks. Two-row plats, 140 feet long.

Of the varieties included in this test for the last six years Great

Divide, Burbank, and Peerless were the heaviest producers in the order named. The yields were 14,484, 13,862, and 13,316 pounds per acre, respectively.

Of the varieties introduced in 1917, White Rose made the highest production of 25,797 pounds for the two years. Following in order of yield were Producer, Pride of Multnomah, American Wonder, and Jones Russet. All of these varieties made better yields than the highest among the old varieties.

With the older varieties the 1917 and 1918 yields were considerably greater than for the three preceding years, and compared favorably with the average yields of the new varieties for the same period.

PERSONNEL OF THE DEPARTMENT OF AGRONOMY DURING THE FIVE YEARS OF THESE INVESTIGATIONS

CHAS. S. KNIGHT, Agronomist, Project Leader.

J. B. MENARDI, JR., Assistant Agronomist, 1914-August, 1917.

GARDNER CHISM, Assistant Agronomist, September-December, 1917.

GEORGE HARDMAN, Assistant Agronomist, 1918-1919.

PLAN OF INVESTIGATIONS FOR 1920

Project No. 2

The plans for the next year's work on this project will include the continuation of row and plat tests of varieties of cereals and forage crops. New varieties of these crops are being obtained each year, and it is very necessary to compare these with our present high producers. The varieties of these crops that have proved to be especially high yielders under field conditions are being tried out in the various agricultural districts with the idea of determining the most suitable varieties of cereal and forage crops for the respective regions. Representatives of the U. S. Department of Agriculture and the Nevada Agricultural Extension Division are cooperating with the Department of Agronomy in this work, so that the most accurate information will be obtained relative to these variety tests.

Project No. 25

DEPARTMENT OF AGRONOMY, AGRICULTURAL EXPERIMENT STATION, IN
COOPERATION WITH IRRIGATION DIVISION, BUREAU OF PUBLIC
ROADS, U. S. DEPARTMENT OF AGRICULTURE

1. Irrigation of Wild-Grass Hay Meadows.

This involves the measurement of water for irrigation of wild-grass hay meadows (a) on a 5-acre tract where the investigator controls the irrigation; and (b) on a 10-acre tract where the water is applied by the method of irrigation practiced commonly in the district.

Proper levees will be constructed to provide for accurate measurement of water, a study of the flora made, and yield of hay obtained. The equipment will include five measuring devices.

2. Introduction of Grasses and Clovers in Wild-Grass Hay Meadows.

After a careful survey of the wild-grass hay meadows along the Humboldt River it is considered impracticable by the investigators to plow this hay land for the planting of cultivated grasses and clovers.

It has been deemed highly practical, however, to drill into these meadows seeds of cultivated grasses and clovers to increase the yield and quality of hay produced. This experiment involves the planting in the hay meadows approximately one-third of an acre each of alfalfa, sweet clover, and a grass mixture of timothy, reedtop, red clover, and alsike clover, under the three following conditions of irrigation:

- (a) Where the water can be controlled and applied regularly.
- (b) Where the water cannot be controlled on account of floods.
- (c) On low areas where irrigation can be controlled, but where the crop on such areas receives an excess of water.

These grasses and clovers are to be planted this fall on the dry meadows with a grain drill which has a grass-seeder attachment, and thus make an early growth in the spring. A study of the flora will be made and yields of hay obtained.

3. Sweet Clover on New Land in Humboldt River Basin.

A large area of land in the Humboldt River Basin that is irrigated for pasture, consisting chiefly of brush and an occasional stool of wild rye-grass, has a water-table too near the surface for the successful growth of alfalfa. Also a great deal of this area contains a small amount of alkali in the surface layer. On most of this area it is believed that sweet clover will produce excellent pasture and require but little water for irrigation. It will also reseed itself if not pastured too heavily. In this experiment two acres will be planted this fall to sweet clover, with Marquis wheat as a nurse crop. The irrigations will be measured and the yield of hay will be obtained if the sweet clover is saved as hay the first year. The equipment will include five measuring devices.

4. Introduction of Sweet Clover in Sloughs.

A considerable area of the wild-hay land in the Humboldt River Basin consists of sloughs which are now producing a very poor yield and quality of pasture. The water-table varies from two to five feet from the surface, but the land does not contain sufficient alkali to injure the growth of sweet clover. This experiment involves the planting of sweet clover in these sloughs, and broadcasting the seed on the snow in the winter. Observations will be made to note the stand and growth of sweet clover.

5. Annual and Biennial Forage Crops.

This involves the planting in rows on plats of approximately one-twentieth acre each, Russian sunflower, corn, Sudan grass, hog millet, and sweet clover. The irrigations will be measured and yields of forage obtained.

6. Irrigation of Alfalfa.

This experiment includes the measurement of water and obtaining yields of hay under the following conditions of irrigation:

- (a) On a thirty-acre tract of alfalfa irrigated in checks, one-half to one acre each, by the practice commonly used in this district.
- (b) On two plats, one-fourth acre and two-fifths acre, respectively,

and 350 feet long, irrigated by borders, making possible a quicker and more uniform irrigation, but in other respects similar to the tract under (a).

These experiments will be conducted on land of the Land Development Company. Senator A. G. Macallan, manager of the company, has offered every possible cooperation for the success of these investigations, and we have expressed to him our appreciation of his personal interest and support in this work.

DEPARTMENT OF VETERINARY SCIENCE**EDWARD RECORDS****PROJECT 15—EQUINE ANEMIA**

The material which has been available for work under this project during the past year has all come from a locality in which, until October, 1918, this disease was not known to be present—namely, around Fallon, Churchill County. Investigational trips to Topaz, Calif., Washoe, Nevada, and North Fork, Elko County, Nevada, where the disease was supposed to be prevalent, produced no material for research work.

The cases at Fallon occurred on three different ranches at approximately the same time. These ranches are located in three different parts of the valley and are from six to ten miles apart. There has been no interchange of horses among them, nearly all of the animals affected not having been off the ranch for a considerable time. It is of particular note that for about the last eighteen months the disease has apparently been quiescent in all of the localities where it had been present in years past.

With the material from Fallon, the disease was reproduced by whole-blood inoculations in several instances. We were also able to reproduce the disease with Berkefeld filtered material from the same source. We have been able to transmit the disease to a second animal with blood inoculations from the animal which received the Berkefeld filtered material. All these animals have been kept under conditions such that the possibility of a natural infection can reasonably well be excluded. With the exception of two cases, we have been unable to keep the virus alive for more than one transmission, and in these two cases it seems to have lost its virulence to a certain extent, and the animals are apparently developing the chronic type of the disease.

A number of animals, which were hangovers from the previous fiscal year and as reported on in the last animal report, either died or were killed in the early fall. One of the animals which received only Berkefeld filtered material developed an acute form of the disease and died.

Satisfactory cases for therapeutic treatment have not been available, and not very much work has been done along this line. A number of individual cases were treated, all of which died.

An investigational trip was made to Yerington to study a disease which was at first thought to be equine anemia; and, as the animals showed all the clinical symptoms, history and blood picture of equine anemia, eight of the animals were brought to the field laboratory at Reno. Continued observations, blood inoculations, and autopsies proved conclusively that this condition was not equine anemia, but sclerostomiasis. As this condition so closely resembles equine anemia and there seems to be no effective means of differential diagnosis, considerable work is being done along the line of positively diagnosing equine anemia. Blood and splenic inoculations

have been made on rabbits, guinea-pigs, and common mice with negative results. In the event that we are able to develop a virulent strain of the virus, it is intended to make inoculations of other domesticated animals, as some investigators are of the opinion that they have been able to reproduce the disease in swine.

Collections of the various forms of internal parasites have been made from the horses autopsied during the past year. At the present time there seems to be no data regarding the internal parasites of the horse from Nevada, and when sufficient material has been collected and identified it is likely that this information may be used for a publication of some form. At the present time some of these parasites are at Washington being identified by the Division of Zoology.

Nearly all of the investigators of equine anemia have noted among the anatomical changes in the disease that the red marrow of the long bones was greatly increased. During the past year, the long bones of the horses with equine anemia, septicemia, sclerostomes, and other conditions as material was available have been studied and reproduced in the natural colors. The collection is fairly representative, and from our observations there seems to be little, if any, correlation between the extent of the red marrow in equine anemia and certain other diseases—at least, there are numerous other conditions in which the red marrow is as extensive as in equine anemia, and there seems to be no particular reason for laying stress on the changes in the bones for positive diagnosis. It is intended to present this material at the next meeting of the American Veterinary Medical Association in New Orleans in the form of a paper illustrated with colored lantern-slides.

General plans for future investigation will be along the lines of:

1. Endeavoring to find some satisfactory means of differential diagnosis. The method of diagnosing this disease by animal inoculation is slow, tedious, and expensive. It seems highly probable that the complement fixation test might be used in this diagnosis. It is expected that considerable work will be done along this line during the coming year.

2. The blood examinations on the animals with equine anemia and with parasites have not been an effectual means of differentiating this disease. Nearly all investigators have laid particular stress on the presence of large numbers of eosinophiles in the blood of animals affected with parasitic diseases. We intend to check up our blood-counts with careful autopsies, with the intention of trying to find out if there is any relation between sclerostomiasis and eosinophilia.

3. The therapeutic treatment of natural and experimental cases will be continued. Some horses which are under treatment at the present time seem to be lingering longer than usual, and it is thought wise to continue this treatment further.

4. A small amount of work has been done during the past year regarding the relationship of parasitic anaphylaxis and equine anemia, and as material is available further work will be done along this line.

5. In cooperation with the Department of Chemistry some chemical analyses are being made of the blood and spleen of equine anemia

horses with the hope of finding out what becomes of the red blood corpuscles in this disease. It is highly probable that, as this work continues, other points may come up from time to time which will require some study. As time and opportunity present, these additional questions will be studied.

PROJECT 16—A HEMORRHAGIC DISEASE AMONG CATTLE

Much of the work done on this project during the year has been a continuation along lines already started. Vaccination of cattle in districts where the disease is prevalent has been continued after the original method—namely, the administration of a bacterin prepared from several strains of *B. bovissepticum* in 5-mil. doses followed in 10 to 12 days by a 2-mil. dose of living cultures of a single strain of *B. bovissepticum* which has lost its virulence for bovines. In all, 8,829 head of cattle have been so vaccinated during the year.

In spite of the fact that the organism used in this vaccination has by no means been definitely incriminated as the cause of the disease, the results of such vaccination appear favorable, the ranchers and veterinarians actually handling the work at least being convinced that the number of cases is materially less in vaccinated than in nonvaccinated herds in the same environment.

The preparation and distribution of antiserum has been continued. Most of this material has been prepared by hyperimmunizing horses with several strains of *B. bovissepticum*, but more recently some has been produced using the anaerobic organism isolated from the liver lesions as an antigen. In all, 127 animals clinically diagnosed as cases of this disease have been treated with these sera, mostly with the old-type serum, with results approximating those previously reported. Not enough of the new-type serum has been used to allow of any comparison of results between it and the old.

Investigations looking to the establishment of a definite etiology of the disease have been continued, with, however, no definite results.

The possibility that the condition might be analogous to the one described by Schultz in the Northwest as due to coccidiosis was thoroughly investigated with negative results. Thorough examination of feces and tissues from naturally occurring cases failed to reveal anything resembling coccidia. These negative findings were checked by comparison against positive material kindly supplied by Dr. Schultz and further confirmed by an oral communication from Dr. O'Bannon of California, who stated that they had both conditions in his State and that they were readily differentiated upon direct comparison.

Considerable work with the anaerobe found constantly in the liver lesions was carried out, satisfactory means of its routine isolation having been devised. The pathogenicity of this organism, however, for either laboratory animals or bovines has not been demonstrated. In a few instances, small animals have died following its injection, but only in a small per cent of trials. One interesting point in this connection was, however, established—namely, the persistence of the organism in the tissues without apparent effect on the host. The organism was recovered from the kidneys of a rabbit twelve days after the administration of a pure culture intravenously,

the animal having to all appearances remained normal during the interval.

The actual identity of the organism cannot be considered as established. Pure cultures were submitted to Dr. K. F. Meyer of the University of California, who is conducting extensive work on the anaerobes. He at first classed it as *B. bifermentans*, but later modified this slightly, designating it as "one of the group."

Serological tests upon blood samples from natural cases, using the anaerobic organism as an antigen, have failed to produce any positive results. The difficulties in technique incident to the peculiarities of the organism may have been largely responsible for this failure, however, and further work along this line is contemplated in an attempt to overcome the obstacles encountered.

A large number of attempts to reproduce the disease in bovines by the oral administration of intestinal contents and organ emulsions, injection of various organ emulsions and pure cultures of the anaerobe subcutaneously, intramuscularly and directly into the gall bladder and liver have all uniformly failed.

Under general considerations it may be said that the disease still continues to be of economic interest, for, while its prevalence in the Carson Valley appears to be decreasing, it is appearing in new localities—as Mason and Smith Valleys, the Fallon district, etc.—and becoming more frequent in the Truckee Meadows.

While reluctant to make such a statement, it would seem at this time that there might be at least a possibility that this disease is not an infectious one, this point of view being suggested at least by the uniform failure of attempts at its transmission by methods which by their very crudeness as to materials used should assure their success. It may be that the solution of this problem will be found in an explanation based on some metabolic disturbance due to peculiarity of diet or environment and not an infective agent.

PROJECT 17—HOG-CHOLERA SERUM PURIFICATION

Active work under this project was concluded during July, 1918, and, as opportunity presented, the data obtained were compiled and checked for the final preparation of an article setting forth the results of the work and the conclusions drawn from it. This final article will be finished and published in some technical journal during the fall of 1919.

PROJECT 18—CONTAGIOUS EPITHELIOMA IN CHICKENS

Very little work was done under this project during the year. The pure type of this disease, due to the specific virus causing the wart-like growths on the skin, appears to have practically become extinct in this State, for the time being, at least.

Some work was done in the way of isolating miscellaneous bacteria from outbreaks of the nonspecific or "roup"-like outbreaks and preparing a bacterin from same which gave very satisfactory results in controlling the type of disease encountered.

Nothing was done along the line of purely scientific work with the virus causing the true contagious epithelioma, the suspension of efforts along this line appearing best in accord with the general policy of the

Station to place all available energy upon problems of actual economic importance to the agricultural industry.

Unless it appears desirable to revive this project by the prosecution of purely scientific research, it would appear that it might well be concluded at this time, as the means for controlling the various types of disease in this group have been worked out to such an extent that the problem is purely one of control work, and as such can be adequately handled by the State Veterinary Control Service.

STATION CHEMICAL LABORATORY

M. R. MILLER

The work of the Chemical Laboratory for the fiscal year 1918-1919 has tended toward division into two main groups—contributory and research work.

The contributory work of the laboratory has consisted principally of analytical work for members of other departments. Analyses of silage used in feeding experiments by Professor Wilson were made. Dry-matter determinations were carried out upon young forage grasses grown by the Department of Range Management. For Dr. Wright of the Veterinary Department in his work on equine anemia, samples of blood and spleen were analyzed for their iron content with the view to the possibility of correlating the data so obtained with other variations in the blood of affected horses. Several miscellaneous samples have come to the laboratory for attention, among them being waters, ashes, fertilizers, and squirrel poison.

The research work, being upon the range plants which have been found poisonous to stock in feeding experiments by the Department of Range Management, while differing from analytical work, may also be considered practically as contributory work inasmuch as the results may have a bearing upon the management of the range as promulgated by that department. The chemist, on taking up his duties on September 1, 1918, found the laboratory well equipped for this type of work. The possession of such a laboratory by the Station well justifies the continuation of research work in this direction, because the data obtained will not only add to scientific knowledge, but are related directly to the agricultural pursuits of the States.

The plants investigated have been *Atriplex canescens*, one of the salt-bushes, and *Prunus demissa*, or the wild chokecherry.

The work on *Atriplex* has disclosed the presence in the plant of a saponin or a mixture of saponins to which it may be possible to ascribe some of the poisonous properties of the plant. Preliminary tests upon this material, a small amount of which has been isolated, have shown it to have the characteristic properties of saponins—hemolytic action on blood corpuscles, affinity for water, toxicity toward fish, lack of nitrogen and foaming in aqueous solutions. A method of preparation of the material has been clearly indicated, and it now remains to prepare a sufficient quantity to study more closely in order that the work on this plant be sufficiently rounded out.

Prunus demissa, which claimed the writer's attention during the early part of the year, was shown to contain a cyanogenetic compound. The toxicity of this plant is undoubtedly due to the prussic acid generated by enzyme or other action. It is possible that there is a seasonal variation in the available amounts of the poison, and in such a case knowledge of the least harmful period would furnish data applicable to the use of this plant as forage. To such an end an investigation of the seasonal variation seemed advisable, but was not undertaken this

spring as was originally planned. To obtain the desired data it is necessary to conduct analyses of the plant at intervals of several weeks during the growing season. The methods used for such analyses should be as near above reproach as possible, and a further study of methods was deemed advisable. To this end experiments have been carried out which tend to show that the prussic acid may be accurately determined by a method of aeration under reduced pressure at ordinary temperatures in contrast with the distillation method previously used by investigators on similar plants and to the accuracy of which serious questions have been raised.

On account of the shortage of students during the past college year it has been difficult to obtain laboratory help, to say nothing of student assistants for some of the simpler operations in the chemical work. With the return of normal college conditions, it is expected that more assistance will be obtained.

DEPARTMENT OF METEOROLOGY**S. B. DOTEN**

From 1906 to 1916 the Nevada Station maintained a Department of Meteorology which was headed by Dr. J. E. Church, assisted by Professor S. P. Fergusson and Arthur Smith. Dr. Church carried on studies of frost and snow which from the beginning attracted much favorable attention in scientific circles. The frost studies were terminated in 1916 and published in Bulletin No. 83, "Value of High-Level Meteorological Data in Forecasting Changes in Temperature." The snow studies were continued until the summer of 1917, when it



Figure 3. Instruments for the study of Climate and Snow, Mount Rose, near Lake Tahoe, at an altitude of 10,800 feet.

became necessary to use the funds of the Station in projects of greater agricultural importance. It had become clear that Dr. Church's studies of snow in the Sierra Nevada would contribute more directly to engineering and forestry than to agriculture. While the necessity of employing the Hatch and Adams Funds for strictly agricultural purposes made the termination of the meteorological projects inevitable, still the outcome of the snow studies has since been watched with keen and cordial interest; and every possible assistance has been given toward their completion,

In 1918 the equipment of the former Department of Meteorology was sold by the Station at a nominal price to the Department of

Engineering of the State of California, by whom, under Dr. Church's direction, the Station's snow studies will be completed and put into practical use.

In this connection the sixth biennial report of the Department of Engineering of the State of California states:

In previous reports of the Department of Engineering, the desirability of being able to forecast the probable magnitude of floods and the duration of run-off for all streams furnishing water for use, has been discussed. * * *

It is contemplated that ultimately reservoirs will be built in the mountains to retain a portion of the floods, so as to reduce the quantity to be cared for by the flood-control works in the valleys. * * *

But it will be necessary to know beforehand when to begin filling the reservoirs. If they should be filled with early flow of water before it has reached flood stage, and then a flood came, there will be no place to store any of it. On the other hand, if they are held empty until flood danger is past, there may be not enough to supply the needs of irrigators and other users.

* * * The source of all floods and of the major part of the late-season flow is the vast snowfields about the heads of the streams.

The department holds, and has so pointed out in previous reports, that surveys of these great snowfield reservoirs should be made and the water content ascertained. From the information obtained, a forecast can be made of the quantity of water that will come down when the snow melts. Such information will be valuable, not alone in directing the operation of filling artificial reservoirs, but in giving foreknowledge of the summer flow, so that the farmer may conduct his irrigation to meet conditions.

The report goes on to discuss the types of meteorological instruments needed to obtain data on climate and snowfall conditions, and then states that—

Professor J. E. Church, Jr., of the University of Nevada, has probably given more scientific study to the subject than any other man in the United States, if not in the world. From a pure regard of the scientific aspect, and a love of nature which finds delight in communing with her in all her moods, Professor Church has prosecuted his investigations for some years, mostly alone, but more recently in cooperation with the local representatives of the U. S. Reclamation Service and the U. S. Weather Bureau.

Although convinced that the study of snowfall in its relation to stream-flow is of great importance and that it is one of its proper functions, the Department of Engineering has heretofore had neither apparatus nor funds with which to make the investigations.

The Legislature two years ago authorized the department to engage in this line of research, but the Act did not become effective in time to do anything last winter. Upon taking up

the subject, it was found that some of the instruments required are not made by any manufacturer and can only be obtained by having them made to order. Under war conditions, it was found impossible to have this done.

Fortunately, however, through the good offices of Professor Church, the department has secured enough apparatus (and practically all there is in the United States) to enable investigations to be made upon the headwaters of about seven of the principal streams of the Sierra, four of which run into the Sacramento and San Joaquin valleys, and three into the irrigated districts of Nevada.

Tentative agreements have been made for the cooperation of the U. S. Forest Service, U. S. Weather Bureau and Reclamation officials, as well as of some large users of water in the territory named.

Professor Church has generously placed his knowledge and experience at the service of the department, and it is felt that it is engaging upon a line of research that will result in very great good.

It is evident that in selling the equipment of the former Department of Meteorology to the California State Department of Engineering, the Station has laid the right foundation for the continuance and the practical application of the results of its former project work in snow studies.

For several years the Nevada Station has planned to issue an elaborate technical bulletin covering in detail the method of snow surveying worked out by Dr. Church, together with tabulations of the results of many years' snow measurements and of various climatic data connected with snow surveying. As the material was gradually put into form for publication it became increasingly evident that the data presented would be of far more use to students of engineering than to students of agriculture. For this reason the Station has cordially agreed to an arrangement brought about by Dr. Church whereby all information on snow surveying will be published by the Department of Engineering of the State of California and will be by them distributed in engineering circles.

The importance of snowfall studies to engineering is further emphasized in a recently published article by Professor Robert DeC. Ward of Harvard University, "The Snowfall of the United States" (Scientific Monthly, November, 1919), in which Professor Ward states:

In the drier sections of the United States many of the most important problems with which engineers have to deal, whether in connection with railroad construction and operation, or hydraulics, or irrigation, or general water-supply, are connected with the depth and conditions of snowfall, and with the amount of water which its melting will supply. In California the mountain snowfall has well been termed the life-blood of the State, and the same is true of most of the vast territory west of the Rocky Mountains.

Thus, the Station finds that its prolonged and highly expensive study of Sierran snowfall made between the years 1906 and 1917

will have an immediate useful application in an adjoining State which will indirectly be of considerable benefit to western agriculture. The value of Dr. Church's good work in the measurement of snowfall has recently received added recognition in Europe. In Switzerland the study of snowfall is of the highest practical importance, particularly in the matter of the study of run-off from the Alps and of conditions which lead to the formation of avalanches. Recent



Figure 4. Driving the Church Snow Sampler in Deep Snow, Sierra Nevada Mountains.

reports from the Swiss Glacier Commission show that Dr. Church's snow sampler and weighing devices have proven very useful in the study of Alpine snows, and there is a good prospect that the methods of snow measurement worked out by Dr. Church, S. P. Fergusson, and Arthur Smith in the Nevada Station will find world-wide use in the survey of accumulated mountain snows.

DEPARTMENT OF ENTOMOLOGY

S. B. DOTEN

PROJECT 19—BITING-FLIES OF CATTLE

Early in the summer of 1918 active field work was resumed upon the project in the field insectary at Topaz, Calif., by J. L. Webb, of the Bureau of Entomology, U. S. Department of Agriculture, and Mr. Noble Waite, a student assistant assigned from the University of Nevada.

In the course of the summer Mr. Webb made excellent progress toward the completion of life-histories of *T. phænops* and *T. punctifer*. An attempt was made to introduce egg parasites for the control of *Tabanus phænops*. The results of the introduction cannot yet be ascertained.

From the beginning one of the most difficult features of the studies conducted under this project has been the study of the egg-laying habits of *Tabanus phænops*. This fly causes far more annoyance than any of the others in the region under study; and it is therefore of especial importance to find under what conditions the eggs are laid and to find the usual breeding-places of the larvæ. After prolonged and most painstaking observation Mr. Webb found a considerable number of egg-masses on short grass and sedgy growths in typical wet meadows. Larvæ in various stages of growth were also observed and the life-history of this insect was completed.

The most important feature of the project work now remaining for investigation is the study of soil-moisture conditions under which the larvæ thrive. Apparently they require soils sufficiently wet and soft to permit them to range freely in search of food. In the coming fiscal year soil and moisture conditions in alfalfa fields and along the banks of irrigation ditches will be thoroughly studied in order to find out whether the larvæ are found in any location except in the swampy undrained meadow lands.

These studies will probably terminate the project, and it is expected that they will show clearly that the only hope of any great decrease in the number of the flies lies in drainage and the reclamation of the swampy portions of valleys where these flies are now abundant.

The introduction of egg parasites will not, however, be abandoned and it is possible that this measure may in the long run prove effective.

DEPARTMENT OF RANGE MANAGEMENT

C. E. FLEMING

The following is, in a general way, a brief summary of the work which has been accomplished in this department during the past fiscal year. Before dealing separately with each project it may be well to state that the major part of the work has been devoted to the studies of poisonous plants. This project has developed to such an extent during the past two years that it has left little time for the other approved projects; and because of the proportions that it has assumed, it has used most of the funds allotted to this department.

PROJECT 22—POISONOUS RANGE PLANTS

This project was commenced on an active basis during May of the year 1918. While the work has been progressing rapidly and satisfactorily, new plants poisonous to range stock are from time to time being discovered, so that it may not be possible to terminate this work until the fall of 1921. It is hoped that the larger part of the work will be accomplished by this date. However, there is always the possibility that at any time a new plant may be discovered that would have to be actively studied. Further, the cause of the mysterious "swell-head" in sheep has not as yet been discovered; and at the present time there is a strong belief among stockmen that it is due to some plant. Thus no definite date can be set at the present time as to the probable completion of this project. In view of what we know now, it may be quite safely stated that the major part will be concluded by the fall of 1921.

The studies have been confined largely to control-feeding tests with cattle and sheep at the field laboratory, supplemented by field observations. Outside of the Station personnel there have been no cooperators. The leadership of this project has been from the start within this department, although much valuable information has been contributed by Dr. L. H. Wright of the Department of Veterinary Science, who has been performing the autopsies, and to Mr. M. R. Miller of the Station Chemical Laboratory, who has been working on the plant poisons found in the various plants studied.

During late years the losses from poisonous plants have been on the increase. This is probably due to the fact that as the valuable and palatable forage on the range becomes gradually depleted the range animals are forced to eat plants which years ago, when there was an abundance of feed, were seldom, if ever, touched. Most of the poisonous plants contain substances which are not relished by animals, but when under the stress of hunger they will eat them, the result often being large numbers of fatalities.

Many of the deaths which have been taking place in the past could not be ascribed to the recognized poisonous plants, and thus it was necessary to initiate control-feeding tests in order to determine which plants on the ranges were directly responsible for the deaths of animals. These control-feeding tests, supplemented by field observa-

tions and chemical studies, have for their object the finding out of the following information: (1) the plants which are toxic; (2) class of animals affected; (3) approximate amounts necessary to cause sickness or death; (4) conditions under which poisoning takes place; (5) description, habitat, and distribution of the poisonous plants; (6) toxic substances responsible for the poisoning; (7) possible remedies, and (8) methods of handling on the range so as to keep losses down to a minimum.

During the past fiscal year these studies have covered thirty different kinds of plants. There were 211 separate feeding tests made, some of which involved feeding the same plant for several days in succession. The following table gives the plants fed which so far have only given negative results. However, these tests are only preliminary and are in no sense to be taken as conclusive as to the toxicity or nontoxicity of the plant.

PLANTS FED DURING YEAR WHICH, PRACTICALLY SPEAKING,
GAVE NEGATIVE RESULTS

Plant fed	No. of trials	Amount fed	Animal fed	Remarks
<i>Astragalus purshii</i>	1	22 lbs.	Ewe and lamb.	Fed to see if it would cause ewe poisoning.
<i>Glyptopleura marginata</i>	1	0.4 lbs.	Yearling lamb.	
<i>Ranunculus macounii</i>	1	5½ lbs.	Sheep	
<i>Senecio nelsonii</i>	1	1½ lbs.	Calf	Collected in pasture where animals were suspected of being poisoned.
<i>Iva axillaris</i>	1	3 lbs.	Yearling lamb.	Abundant in pasture where poisoning was suspected.
Smut on carex heads	1	½ lb.	Yearling lamb.	
<i>Thalesia</i> , sp?	1	½ lb.	Suckling lamb.	Suspected as cause of "big head" by shepherd.
<i>Byanthus empetrifolius</i>	3	2 ozs. to 1½ lbs.	Sheep	Belongs to heath family, some members of which are poisonous.
<i>Caltha</i> , sp?	1	1.1 lbs.	Sheep	
<i>Cassiope mertensiana</i>	1	½ lb.	Lamb	Belongs to heath family.
<i>Artemisia tridentata</i>	1	1 lb. daily for 5 days	Sheep	
<i>Chamaesyce serpyllifolia</i>	3	1 to 10 ozs.	Ewe and lamb	
<i>Veratrum californicum</i>	2	6½ to 8 lbs.	Calf	This plant is probably slightly poisonous.
<i>Aconitum columbianum</i>	1	2½ lbs.	Sheep	Probably slightly poisonous.
<i>Delphinium cardinalis</i>	1	1 lb.	Calf	Probably poisonous.
<i>Asclepias cordifolia</i>	5	½ to 2½ lbs.	Sheep	Probably poisonous; less so than other species of <i>Asclepias</i> .
<i>Atriplex confertifolia</i>	2	9½ and 17½ lbs.	Sheep and calf.	Calf lost 10 pounds in weight.
<i>Sphaeralcea ambigua</i>	1	10 lbs.	Sheep	

The following twelve kinds of plants have produced poisoning when fed. The toxic and lethal doses have been found to be as follows:

***Triglochin maritima* (Arrow-Grass).**

Four sheep were fed fresh amounts varying from 1 lb. to 2 lbs. without any symptoms. Two were fed 2½ lbs. to 4½ lbs., both being made sick, but recovered in a short time. Three were killed with amounts varying from 1½ lbs. to 2½ lbs.

Seven sheep were fed air-dried material, the amounts varying from 1 to 5 ozs. without producing any symptoms. Four, which were fed from 4 ozs. to 12 ozs., became sick, but recovered. Four were killed by amounts varying from 2½ ozs. to 8 ozs.

Four yearling calves were fed as high as 13 lbs. of the fresh green

material in a day without producing any apparent symptoms. One yearling calf was readily killed with 8 ozs. of air-dried material.

Cicuta occidentalis.

Two horses were made most violently sick—one with 8 ozs. and the other with 15 ozs. of the tubers. For humane reasons both animals were shot. It was believed they would have died, so they were relieved of their suffering. One sheep was killed with 5 ozs. of the tubers.

Asclepias mexicana.

Two yearling calves were fed $3\frac{1}{2}$ and $4\frac{1}{2}$ lbs., respectively; both were made sick, but recovered. Another yearling calf was killed with 5 lbs. of the green material, and with 12 ozs. of air-dried leaves another calf was killed.

A sheep fed first 3 ozs. and a few days later 4 ozs. of dry leaves was only made slightly sick, while another fed 4 ozs. of similar material was made violently sick, but recovered. Two sheep were each fed 5 ozs.: one was only slightly sick, the other very sick, both recovering. Two sheep were fed seeds—one 2 ozs. and the other 5 ozs.—neither of which produced any apparent symptoms.

Artemisia spinescens.

A sheep was fed $12\frac{1}{2}$ lbs. of green material in 9 days, from $\frac{1}{2}$ to 3 lbs. being eaten each day. No symptoms were developed.

A yearling calf was fed $9\frac{1}{2}$ lbs. of green material in 6 days, from $\frac{1}{2}$ to 3 lbs. each day without showing any symptoms. A yearling calf was fed $4\frac{1}{2}$ lbs. in one day; became sick, but recovered in a few days. Three yearling calves were killed with fresh material varying in amounts from $4\frac{1}{2}$ to $6\frac{3}{4}$ lbs.

Tetradymia glabrata.

Four yearling calves were fed amounts varying from 1 to 8 lbs. without producing any symptoms. This plant is toxic for sheep, but so far it has not been found poisonous for cattle.

Atriplex canescens.

A yearling calf was fed 2 lbs. without showing any symptoms. Three sheep fed from $2\frac{1}{4}$ to $4\frac{1}{4}$ lbs. were only made sick. Four pounds of green material were dried and then fed without producing any symptoms.

Atriplex rosea.

A yearling calf was fed $12\frac{1}{2}$ lbs. without any ill effects. Four sheep were fed amounts varying from $1\frac{1}{4}$ to 2 lbs. without any symptoms appearing. A sheep was fed 1 lb. a day for 6 days without any ill effects, but lost 7 lbs. in weight, although the animal had free access to alfalfa all the time. Another sheep fed 1 lb. was slightly sick, while another one fed 2 lbs. was killed.

Delphinium andersonii.

Six feedings were made with this plant to cattle, three being negative, the amounts fed varying from 2 to $2\frac{1}{2}$ lbs. A yearling calf fed 3 lbs. was made sick, but recovered. Two yearling calves died with amounts of $3\frac{1}{2}$ and 5 lbs. respectively.

Two yearling lambs were each fed 4 and 5½ lbs. respectively, both becoming sick, but both recovered.

Halerpestis cymbalaria.

A yearling calf was fed one pound, became sick, but recovered. All other feedings to cattle were negative.

A sheep fed ¾ lb. became sick, another fed 1 lb. died, and all other feedings to sheep were negative.

Solidago spectabilis.

Six yearling calves were fed amounts varying from 1 to 7½ lbs. without producing any symptoms.

Fifteen feedings were made to sheep varying from 1 to 2¾ lbs. One fed 2¼ lbs. was sick, the remainder of the feedings being negative. A sheep was fed 1 lb. a day for four days without any apparent symptoms developing.

Kalmia microphylla.

From the 10th to the 12th of July a number of feedings were made of laurel from the Sierra from King's Creek Canyon beyond Chester, Calif. Two calves were fed ¾ and 1 lb. respectively. Both became sick, but recovered. Three sheep were each fed 1 oz.; one was slightly sick, the other two showed no symptoms. Eight sheep fed from 2 ozs. to 8 ozs. all became sick, the severity of poisoning being almost in proportion to the amount fed. From July 17 to 19 three yearling calves were fed material collected near Mount Rose. One fed 4½ lbs. showed no symptoms; two fed 1 and 1½ lbs., respectively, became sick, but recovered. Ten sheep were fed amounts varying from 1 oz. to 6 ozs. Those fed from 1 to 4 ozs. showed no symptoms. Those fed 5 and 6 ozs. became sick, but recovered. On the 25th of August a sheep was fed 8 ozs. of material from near Emerald Bay, Calif. The animal was very sick, but recovered.

From September 4 to 7 another lot of material was collected from King's Creek Canyon. A yearling calf fed 6 ozs. showed no symptoms. Four calves fed amounts varying from 10 ozs. to 2½ lbs. were sick, but recovered. Four sheep were fed amounts varying from 4 to 10 ozs. The one fed 4 ozs. was sick; the one fed 10 ozs. quite sick; one fed 6 ozs. very sick, lying for five days in a stupor. One fed 8 ozs. died.

The material from near Mount Rose appeared to be less toxic than that from King's Canyon, and the last material collected from King's Canyon produced quite different symptoms than the material collected earlier from the same locality. From this it would seem that the plant varies in toxicity in different environments, and that there is a considerable seasonal change in the poisons present.

***Zygadenus paniculatus* (Death Camas).**

Eighteen feeding tests of this plant were made to yearling calves. In two tests ¼ lb. failed to produce any symptoms; in three tests of ¾ lb. symptoms were produced twice; in five tests ½ lb. produced symptoms twice; in two tests ¾ lb. failed once to produce symptoms; 1 lb. produced symptoms in each of the three times tried; and with another calf 1½ lbs. failed to produce any symptoms in the one trial made.

In some of the feedings it was intended to use larger amounts, but regurgitation commenced and the feedings had to be stopped.

During the two seasons that this plant has been fed to sheep it has been found that less than $\frac{1}{4}$ lb. rarely produces poisoning symptoms, and in a few cases over 1 lb. has been fed with negative results. Sheep most frequently have been made sick with amounts in excess of 1 lb., while most of the deaths have resulted from $1\frac{1}{4}$ - to 4-lb. feedings.

***Zygadenus venenosus* (Death Camas).**

Yearling calves have been fed amounts from $\frac{3}{4}$ to 1 lb. with negative results. A feeding of $1\frac{1}{2}$ lbs. made a good-sized yearling sick, while $\frac{4}{5}$ lb. made a smaller-sized one quite sick.

When fed to sheep $\frac{1}{2}$ lb. produced no symptoms; 1 lb. made a sheep sick and 2 lbs. produced death.

***Hordeum jubatum* (Fox-Tail).**

This grass was found to be causing considerable mechanical injury when fed to stock, more especially sheep. During the early spring these injuries were studied in flocks of lambing ewes and the results have been published in Bulletin 97, "Don't Feed Fox-Tail Hay to Lambing Ewes."

The above summarizes very briefly the progress made with the poisonous plant project. It does not cover the hundreds of feeding tests which were made a year ago. Sufficient data are now available for at least three publications.

PROJECT NO. 20—WHITE-SAGE STUDIES

But little progress has been made with this project during the past year, due mainly to a lack of time to actively carry on the work.

This plant is one of our most valuable range plants, especially on the winter feeding-grounds. It is a plant which is rapidly disappearing on many of the intensively grazed ranges. The primary object of this investigation is to develop a system of grazing based upon the growth requirements of the plant which will build up and maintain its productivity year after year.

During the past year many germination tests have been made with the white sage. In several instances they have been highly satisfactory; in others the results have been negative. In a preliminary way the proper depth of seeding has been determined.

Until some of the other projects which are more pressing and urgent at the present time have been completed, it will be impossible to do much with this project.

PROJECT NO. 24—METHODS OF INCREASING THE PERCENTAGE OF LAMBS IN NEVADA FLOCKS

This project was commenced in 1918. It will probably take five years to work out all the details connected with it. It is quite wide in scope, involving: (1) types of bucks to be used; (2) best methods of breeding in the fall; (3) the care of the ewe while on the winter range; (4) proper feeds and handling during lambing, and (5) best methods of handling on the summer range to insure minimum loss and the most rapid and steady growth of the lamb.

The effect of the use of different grades of bucks has been practically completed, the studies covering a large number of range breeding ewes. Data are now available on the proper management and care of range ewes from the time that they are removed from the summer ranges until they are returned again. Especially valuable is the information on the proper winter care of the ewe as it affects the percentage of lambs born and reared.

Ewes have been purchased for the purpose of finding out the best feeds to use during lambing time, feeds which will stimulate an abundant supply of milk which has such a direct bearing upon the resultant spring and summer growth of the lamb.

Comparisons of gains made by lambs under different methods of handling while on the summer ranges have already been worked out.

PROJECT 23—REVEGETATION OF DEPLETED RANGES

The major part of the work which was accomplished during the past year was in connection with the proper depth to plant grass seeds in order to insure maximum germination and still permit of the seeds being planted just as deeply as possible so as to make the best use of the limited moisture supply found in the range soils.

A detailed working plan has been drawn up which will involve the following: (1) The length of time it takes the various pasture seedlings to become permanently established before being allowed to be grazed without undue injury; (2) severity of grazing which should be allowed during the first and second seasons after the pasture has been established without material loss in density of seedlings; (3) the proper height growth of the various plants which should be allowed before the grazing to secure (a) maximum yield, (b) maximum yield year after year with a minimum loss through nonuse, (c) length of time and severity of grazing which can be allowed and still secure a desirable crop for revegetation purposes; (4) the proper depth the seeds should be planted to secure maximum germination and density and least injury through pulling by grazing animals in (a) sandy soil, (b) sandy loam, (c) dry soil, (d) clay loam, (e) gravelly soil, (f) alkaline soil; (5) proper mixture of seeds to secure (a) maximum yield, (b) prolonged density, (c) best seasonal growth—spring, summer and fall, (d) greatest palatability.

The above will involve considerable time and detailed study, and in view of this it will not be possible to actively initiate this project until Projects 22 and 24 are almost complete, for they will occupy the major portion of the present personnel of this department.

STATE OF NEVADA

List of Registered Automobiles
and Motorcycles, to
Mar. 31, 1920

FIRST QUARTERLY REPORT

Compiled by
GEORGE BRODIGAN
Secretary of State of the State of Nevada



CARSON CITY, NEVADA

STATE PRINTING OFFICE : : JOE FARNSWORTH, SUPERINTENDENT
1919

FIRST QUARTERLY REPORT (1920) OF REGISTERED AUTOMOBILES AND MOTORCYCLES

Compiled by GEORGE BRODIGAN, Secretary of State

The following pages, compiled in numerical rotation, contain names and addresses of owners who have registered their motor vehicles for the year 1920 with the Secretary of State from January 1, 1920, to March 31, 1920, inclusive, together with the number of the official license-plate issued to each for use as prescribed by law.

This form was adopted at request of some of the officials whose duties include the enforcement of the motor-vehicle laws.

LIST OF REGISTERED AUTOMOBILES FOR QUARTER ENDING MARCH 31, 1920

Make of vehicle is given last.

40001.....C. A. Stout, Reno, Cadillac.	40080.....Chas. E. Catoir, Reno, Buick.
40002.....John W. Scott, Carlin, Ford.	40081.....R. W. Thompson, Fallon, Ford.
40003.....Julius Schwarzachild, Reno, Buick 6.	40082.....E. A. Ricketts, Mason, Ford.
40004.....Mutual Creamery Co., Reno, Ford Trk.	40083.....Chas. T. Spears, Ash Meadows, Ford.
40005.....Standard Oil Co., Reno, Dodge.	40084.....Chick Lund, Searchlight, Ford.
40006.....E. Johnson, Dayton, Mitchell.	40085.....A. P. Ellis, Reno, Ford.
40007.....L. A. Granfeldt, Reno, Packard.	40086.....U. J. Travis, Fallon, Chevrolet.
40008.....H. L. Dressler, Sheridan, Studebaker.	40087.....C. G. Hamilton, Silver City, Reno.
40009.....Louis Heitman, Sheridan, Studebaker.	40088.....N. J. Barry, Reno, Haynes.
40010.....J. L. Seifert, Sparks, Ford.	40089.....H. W. Ball, Las Vegas, Dodge.
40011.....F. L. Bellows, Reno, Buick.	40090.....J. D. McMillen, Fernley, Ford.
40012.....H. P. Robinson, Montello, Cadillac.	40091.....John Borge, Yerington, Studebaker.
40013.....H. Cohn, Carson, Ford.	40092.....George Orange, Schurz, Ford.
40014.....A. M. Boyce, Yerington, Buick.	40093.....William Huggard, Goldfield, Ford.
40015.....Albert Boyne, Reno, Ford.	40094.....Peter Jensen, Reno, Cole 8.
40016.....E. C. Watson, Luning, Ford.	40095.....H. C. Masters, Reno, Oakland.
40017.....W. H. Churchyard, Yerington, Chalm.	40096.....Chas. Wara, Reno, Pilot.
40018.....Mrs. G. Webster, Yerington, King 8.	40097.....M. Ramelli, Reno, Buick C-37.
40019.....Edward Brown, Tonopah, Hudson 6.	40098.....Wm. E. Kruger, Reno, Overland.
40020.....Charles Walbersloh, Fallon, Ford.	40099.....Wm. E. Kruger, Reno, Willys-Knight.
40021.....Chas. A. Taylor, Lovelock, Ford.	40100.....M. D. O'Brien, Reno, Hupmobile.
40022.....Mrs. Lottie Ferrel, Reno, Oldsmobile.	40101.....B. E. Wiley, Lovelock, Buick.
40023.....P. E. DuBois, Wadsworth, Ford.	40102.....B. E. Wiley, Lovelock, Ford.
40024.....Wm. N. Schuyler, Las Vegas, Ford.	40103.....C. W. Stock, Fernley, Buick.
40025.....Claude H. Church, Tonopah, Essex.	40104.....Henry Francisconi, Reno, Ford.
40026.....Rosalie or G. Cameron, Reno, Buick.	40105.....Frank J. Bart, Reno, Ford.
40027.....John L. Butler, Tonopah, Ford.	40106.....Walter W. Wells, Searchlight, Hupmo.
40028.....John L. Butler, Tonopah, Chandler.	40107.....Albert D. Ayers, Reno, Haynes.
40029.....John L. Butler, Tonopah, Chandler.	40108.....Ida May Heitman, Reno, Ford.
40030.....Louis Meiss, Reno, Chevrolet.	40109.....Paul Tholl, Reno, Ford.
40031.....Mrs. A. T. Eveleth, Verdi, Buick.	40110.....Dr. F. T. Brown, Minden, Overland.
40032.....Martin Russell, Reno, Buick.	40111.....L. A. Brown, Reno, Studebaker.
40033.....Umatilla T. Mng. Co., Tonopah, Ford.	40112.....C. A. Milbery, Reno, Studebaker.
40034.....Pete Thompson, Reno, Oldsmobile.	40113.....Brown Milbery, Inc., Reno, Maxwell.
40035.....S. D. Forman, Tonopah, Ford.	40114.....Reno Ice Delivery, Reno, Federal.
40036.....Geo. B. Clark, Schurz, Ford.	40115.....Reno Ice Delivery, Reno, Federal.
40037.....Arthur G. Elvin, Battle Mtn., Ford.	40116.....Reno Ice Delivery, Reno, Ford.
40038.....Herman J. Degemar, Fernley, Ford.	40117.....Reno Ice Delivery, Reno, Ford.
40039.....M. R. Walker, Reno, Buick.	40118.....Alice Feehyen, Tonopah, Ford.
40040.....Antone Merialdo, Palisade, Ford.	40119.....S. Peterson, Sparks, Reno.
40041.....Knox Divide Mng. Co., Tonopah, Ford.	40120.....L. G. Ellis, Mason, Ford.
40042.....A. F. Neidt, Reno, Buick.	40121.....Steinheimer Bros., Reno, Studebaker.
40043.....Neidt & Gavin, Reno, Chevrolet.	40122.....Sadie Steinheimer, Reno, Studebaker.
40044.....Neidt & Gavin, Reno, Ford.	40123.....A. Swanson, Reno, Studebaker.
40045.....W. A. MacCormack, Reno, Reo F6.	40124.....H. E. Blasdel, Sparks, King 8.
40046.....R. Stover, Reno, Ford.	40125.....Guy Hill, Winnemucca, Ford.
40047.....H. L. Conner, Reno, Ford.	40126.....Mary Langwith, Winnemucca, Buick.
40048.....A. B. Carden, Elko, Dodge.	40127.....Jack Goldman, Tonopah, Dodge.
40049.....E. S. Van Leer, Elko, Dodge.	40128.....Andrew Kinneberg, Battle Mtn., Ford.
40050.....John A. Jurgenson, Lovelock, Ford.	40129.....Chas. Ziegler, McGill, Hupmobile.
40051.....Mrs. J. A. Jurgenson, Lovelock, Dort.	40130.....U. S. Reclamation Serv., Fallon, Ford.
40052.....Edward M. Lusty, Reno, Oldsmobile.	40131.....U. S. Reclamation Serv., Fallon, GMC.
40053.....E. J. Houghtaling, Rochester, Ford.	40132.....U. S. Reclamation Serv., Fallon, Ford.
40054.....H. S. Allen, Sparks, Ford.	40133.....U. S. Reclamation Serv., Fallon, Ford.
40055.....J. R. Cessna, Reno, Ford.	40134.....U. S. Reclamation Serv., Fallon, Ford.
40056.....U. S. Pub. Roads Bureau, Reno, Ford.	40135.....U. S. Reclamation Serv., Fallon, Ford.
40057.....T. M. Grounseil, San Jacinto, Oakland.	40136.....U. S. Reclamation Serv., Fallon, Ford.
40058.....F. W. Simpson, Reno, Oldsmobile.	40137.....U. S. Reclamation Serv., Fallon, Ford.
40059.....P. W. Simpson, Reno, Dodge.	40138.....U. S. Reclamation Serv., Fallon, Ford.
40060.....J. R. Bradley Co., Reno, Ford.	40139.....U. S. Reclamation Serv., Fallon, Ford.
40061.....J. R. Bradley Co., Reno, Ford Chassis.	40140.....U. S. Reclamation Serv., Fallon, Ford.
40062.....J. R. Bradley Co., Reno, Buick.	40141.....U. S. Reclamation Serv., Fallon, Ford.
40063.....J. R. Bradley Co., Reno, Ford Chassis.	40142.....U. S. Reclamation Serv., Fallon, Ford.
40064.....J. R. Bradley Co., Reno, Ford.	40143.....U. S. Reclamation Serv., Fallon, Ford.
40065.....R. Korman, Reno, Cadillac.	40144.....U. S. Reclamation Serv., Fallon, Ford.
40066.....C. R. Evans, Goldfield, Packard.	40145.....U. S. Reclamation Serv., Fallon, Dodge.
40067.....J. P. Raine, Reno, Buick.	40146.....U. S. Reclamation Serv., Fallon, Ford.
40068.....F. W. McCulloch, Fernley, Oldsmobile.	40147.....U. S. Reclamation Serv., Fallon, Dodge.
40069.....Louis A. Yelland, Aurum, Ford.	40148.....E. A. Edelbrock, Reno, Chevrolet.
40070.....G. Del. Wolfenaparger, Reno, Chandler.	40149.....C. F. Akina, Reno, Dodge.
40071.....Verdi Lumber Co., Winnemucca, Ford.	40150.....J. G. Bolander, Reno, Chevrolet.
40072.....Verdi Lumber Co., Winnemucca, Reo.	40151.....W. H. Aby, Goldfield, Dodge.
40073.....W. M. Gardiner, Reno, Overland.	40152.....E. C. Newman, Reno, Chevrolet.
40074.....John S. Cottrell, Sparks, Dodge.	40153.....Nev. Packing Co., Reno, Federal.
40075.....F. M. West, M.D., Lovelock, Reo 5.	40154.....Nev. Packing Co., Reno, Ford.
40076.....J. B. Humphrey, Reno, Dorris.	40155.....Nev. Packing Co., Reno, Ford.
40077.....Edith L. St. Cyr, Ludwig, Ford.	40156.....Nev. Packing Co., Reno, Chevrolet.
40078.....Eugene F. Howard, Dayton, Cadillac.	40157.....Nev. Packing Co., Reno, International.
40079.....H. R. Moeller, Goodsprings, Ford.	40158.....Nev. Packing Co., Reno, Federal.

- 40159...Nev. Packing Co., Reno, Ford.
 40160...J. L. Raffetto, Reno, Oldsmobile.
 40161...J. A. Crescenza, Austin, Buick.
 40162...W. G. Francis, Austin, Buick.
 40163...W. G. Francis, Austin, Ford.
 40164...Geo. Russell, Elko, Cadillac.
 40165...Geo. Russell Co., Elko, Dodge.
 40166...Geo. Russell Co., Elko, Ford.
 40167...Geo. Russell Co., Elko, Ford.
 40168...Geo. Russell Co., Elko, Dodge.
 40169...H. Hewetson, M.D., Las Vegas, Stude.
 40170...H. Hewetson, M.D., Las Vegas, Metz.
 40171...Henry Schempp, Reno, Buick.
 40172...W. D. Front, Las Vegas, Dodge.
 40173...Jas. M. Keir, Wonder, Dodge.
 40174...A. W. Friberg, Fallon, Chevrolet.
 40175...Carl Kuhn, Reno, Dodge.
 40176...Carl Ridenour, Reno, Ford.
 40177...C. G. Swingle, Hazen, Ford.
 40178...C. G. Swingle, Hazen, Ford.
 40179...H. E. Pierson, Reno, Buick.
 40180...R. F. Raine, Palisade, Hudson.
 40181...Fred Preushoff, Sparks, Reo.
 40182...L. L. Schremp, Tonopah, Dodge.
 40183...A. P. Lauritzen, Fernley, Chevrolet.
 40184...F. A. Delaney, Palisade, Ford.
 40185...J. P. Hesse, Las Vegas, Studebaker.
 40186...J. F. Hesse, Las Vegas, Ford.
 40187...E. E. Schwartz, Dixie Valley, Ford.
 40188...James H. Graham, Ione, Ford.
 40189...Hugh P. Herd, Tonopah, Chalmers.
 40190...C. F. Burton, Reno, Scripps-Booth.
 40191...Geo. Wingfield, Reno, Cadillac.
 40192...Robert Ray, Searchlight, Hupmobile.
 40193...M. J. King, Dayton, Maxwell.
 40194...Willett Barton, Searchlight, Hupmo.
 40195...Washoe Market, Reno, Ford.
 40196...John B. Casper, Fallon, Dodge.
 40197...Monte Thomas, Goodsprings, Buick.
 40198...Pete P. Arena Co., Austin, Hudson 6.
 40199...Charles B. Henderson, Elko, Cadillac.
 40200...S. M. Pickett, Reno, Haynes.
 40201...Nick Chatovich, Tonopah, Ford.
 40202...Divide Cons. M. Co., Tonopah, Ford.
 40203...F. E. Baker, Lovelock, Oakland.
 40204...J. C. Mathews, Yerington, Hudson.
 40205...Lawrence Munk, Lovelock, Ford.
 40206...Charles Parker, Reno, Reo.
 40207...G. M. Erickson, Nelson, Chalmers.
 40208...J. W. Bement, Sparks, Chevrolet.
 40209...J. Miramon, Reno, Cadillac.
 40210...L. P. Johnson, Lovelock, Reo.
 40211...James H. Down, Goodsprings, Ford.
 40212...H. Cornelison, Goodsprings, Ford.
 40213...Aron J. Davies, Goodsprings, Ford.
 40214...Dana P. McGown, Reno, Ford.
 40215...S. T. Spann, Sparks, Hudson.
 40216...W. A. Wittse, Sparks, Ford.
 40217...Martin Straaden, Fallon, Ford.
 40218...J. W. Middleton, Fernley, Maxwell.
 40219...H. H. Rice, Reno, Hudson.
 40220...S. Mortensen, Verdi, Studebaker.
 40221...S. Mortensen, Verdi, Studebaker.
 40222...Mrs. A. J. Loftus, Dayton, Cadillac.
 40223...Harry Johnson, Minden, Ford.
 40224...Louisiana Con. M. Co., Tonopah, Ford.
 40225...F. W. Draper, Tonopah, National.
 40226...E. R. Sans, U. S. Survey, Reno, Ford.
 40227...Samuel J. McLean, Stewart, Ford.
 40228...Sam Nelson, Reno, Chevrolet.
 40229...U. S. Gypsum Co., Arden, Ford.
 40230...F. D. Williams, Arden, Ford.
 40231...J. C. Baker, Lovelock, Ford.
 40232...J. C. Reed, Fernley, Buick.
 40233...Fred Anderson, Goldfield, Ford.
 40234...M. Schiappacasse, Reno, Oakland.
 40235...Nick Luisich, Reno, Buick.
 40236...Gust Hanson, Tonopah, Hudson 6.
 40237...T. J. Lee, Goldfield, Ford.
 40238...Union Oil Co. of Nev., Minden, Ford.
 40239...Union Oil Co. of Nev., Reno, Stude.
 40240...Union Oil Co. of Nev., Reno, Ford.
 40241...Union Oil Co. of Nev., Reno, Ford.
 40242...Union Oil Co. of Nev., Reno, White.
 40243...Union Oil Co. of Nev., Minden, White.
 40244...Dr. A. R. DaCosta, Reno, Nash.
 40245...Nevada Packing Co., Reno, Dodge.
 40246...E. R. Price, Reno, Dodge.
 40247...H. A. Sinnott, Candelaria, Ford.
 40248...Felix Mariani, Wadsworth, Oakland.
 40249...Dr. Q. S. Wong, Reno, Chandler.
 40250...Dr. Q. S. Wong, Reno, Hudson.
 40251...M. J. Rand, M.D., Elko, Dodge.
 40252...Ellsworth Herrick, Reno, Ford.
 40253...Maz Tillig, Fernley, Ford.
 40254...C. F. Davis, Lovelock, Ford.
 40255...M. L. Tuggle, Fallon, Ford.
 40256...Jean F. Fayle, Goodsprings, Hudson 6.
 40257...T. J. Renaux, Goodsprings, Ford.
 40258...F. P. Dann, Reno, Liberty 6.
 40259...Morrel A. Powell, Fallon, Ford.
 40260...Edward Records, Reno, Dodge.
 40261...Anna Collins, Reno, Buick 6.
 40262...S. E. Streiff, Reno, Studebaker.
 40263...Tait's Cash Market, Reno, Ford.
 40264...J. H. Ladd, Las Vegas, Overland.
 40265...C. R. Lewis, Carson City, Buick.
 40266...J. M. Short, Reno, McFarlan.
 40267...F. W. Cook, Genoa, Chalmers.
 40268...State Engineer, Carson City, Ford.
 40269...State Engineer, Carson City, Dodge.
 40270...Austin Nev. Con. M. Co., Austin, Ford.
 40271...Louis Luchetti, Reno, Dodge.
 40272...Palace Bakery, Reno, Ford.
 40273...Chas. E. Tracey, Round Mtn., Ford.
 40274...John Ferretto, Lovelock, Metz.
 40275...Frank E. Evans, Lovelock, Chevrolet.
 40276...Gregory Mariani, Derby, Oakland.
 40277...Freitas Bros., Yerington, Buick 4.
 40278...Antonia Scossa, Yerington, Buick 6.
 40279...C. B. Thraikill, Yerington, Buick.
 40280...Thomas B. Selby, Winnemucca, Reo.
 40281...Thomas B. Selby, Winnemucca, Reo.
 40282...A. E. Albers, Reno, Buick.
 40283...H. G. Hubbard, Reno, Chevrolet.
 40284...S. G. Broyles, Battle Mountain, Ford.
 40285...Nev. Alfalfa Meal Co., Fallon, Ford.
 40286...D. J. Fodrin, Sparks, Oldsmobile.
 40287...A. D. Bird, Reno, Ford.
 40288...Robert E. Bowers, Reno, Ford.
 40289...R. W. Cattermole, Goldfield, Cadillac.
 40290...John A. Fuller, Reno, Hupmobile.
 40291...Wm. Rallins, Wabuska, Ford.
 40292...Charles H. Hicks, Fernley, Ford.
 40293...C. E. Fletcher, Reno, Hupmobile.
 40294...Andrew Christensen, Genoa, Ford.
 40295...Maute Esser, Carson, Saxon.
 40296...Gibraltar Silver M. Co., Tonopah, Nash.
 40297...Gibraltar Silver M. Co., Tonopah, Ford.
 40298...A. L. Borcherding, Tonopah, Overland.
 40299...Dick Thrane, Gardnerville, Buick.
 40300...F. L. Ypparaguirre, Reno, Oldsmobile.
 40301...MacNamara C. M. Co., Tonopah, GMC.
 40302...John Bate, McGill, Buick.
 40303...L. Sandberg, Reno, Ford.
 40304...A. J. Manhan, Reno, Ford.
 40305...W. W. Carpenter, Lovelock, Case.
 40306...W. W. Carpenter, Lovelock, Case.
 40307...W. Ray Williams, Reno, Buick.
 40308...M. C. Quin, Tonopah, Ford.
 40309...H. G. Taylor, Tonopah, Ford.
 40310...R. W. Montgomery, Las Vegas, Buick.
 40311...Harry S. Gallaway, Thompson, Ford.
 40312...Chas. Blaene, Fernley, Ford.
 40313...Fritz Klauer, Elko, Hudson.
 40314...Fritz Klauer, Elko, Ford.
 40315...Chas. W. Clubine, Lamaille, Dodge.
 40316...John Henderson, Elko, Franklin.
 40317...C. J. McBride, Sparks, Oakland.
 40318...J. M. Ullom, Las Vegas, Ford.
 40319...Associated Oil Co., Reno, Dodge.
 40320...Associated Oil Co., Reno, Federal.
 40321...Bert Mizer, Searchlight, Hudson.
 40322...G. R. Holcomb Est. Co., Reno, Hudson.
 40323...G. H. Holcomb Est. Co., Reno, Chevro.
 40324...G. R. Holcomb Est. Co., Reno, Ford.
 40325...G. R. Holcomb Est. Co., Reno, Haynes.
 40326...G. R. Holcomb Est. Co., Reno, Haynes.
 40327...H. J. Murrish, Lovelock, Buick.
 40328...Geo. E. Trosi, Reno, Studebaker.
 40329...John Monte, Wadsworth, Buick.
 40330...Ralph J. Vannoy, Fallon, Chandler.

40331. T. A. Jones, Fallon, Maxwell.
 40332. Williams Estate Co., Fallon, Pierce A.
 40333. Williams Estate Co., Fallon, Dodge.
 40334. Williams Estate Co., Fallon, Ford.
 40335. Williams Estate Co., Fallon, Ford.
 40336. Williams Estate Co., Fallon, Ford.
 40337. Williams Estate Co., Fallon, Ford.
 40338. W. A. Keddle, Fallon, Pierce Arrow.
 40339. W. A. Keddle, Fallon, Pierce Arrow.
 40340. John Frank, Schurz, Ford.
 40341. James H. Wichman, Wichman, Dodge.
 40342. E. P. Johnson, Goldfield, Ford.
 40343. C. F. Spilman, Reno, Essex.
 40344. Geo. Abby, Mound House, Lexington.
 40345. Leopold Pils, Pioche, Ford.
 40346. Emil Peraldo, Paradise, Dodge.
 40347. C. D. Breeze, Las Vegas, Ford.
 40348. Wm. Gutch, Fernley, Ford.
 40349. John Fallon, Round Mtn., Ford.
 40350. Warren B. Earl, Reno, Dodge.
 40351. Mrs. N. Borbridge, Reno, Haynes.
 40352. C. L. Rosengren, Reno, Cadillac.
 40353. A. J. Alves, Lovelock, Studebaker.
 40354. E. A. Williams, Las Vegas, Reo.
 40355. H. E. Thatcher, M.D., Las Vegas, S. B.
 40356. Kutcher & Curtis, Las Vegas, Ford.
 40357. Chas. Tolzi, Yerington, Ford.
 40358. Antone Manta, Yerington, Ford.
 40359. M. Dellamonica, Yerington, Ford.
 40360. Howard Melvin, Round Mtn., Ford.
 40361. Charles Hinds, Simpson, Buick.
 40362. Roland Snyder, Yerington, Dodge.
 40363. John Snyder, Yerington, Ford.
 40364. James A. Holman, Reno, Reo.
 40365. H. E. Mornston, Sparks, Ford.
 40366. W. C. Short, Reno, Overland.
 40367. Ernest Heidenbrand, Lovelock, Chev.
 40368. W. E. Stromer, Goodsprings, Overland.
 40369. W. E. Stromer, Goodsprings, Locombl.
 40370. LeRoy N. French, Reno, Franklin.
 40371. Geo. Christensen, Reno, Ford.
 40372. Victor Wagner, Reno, Ford.
 40373. Chas. Swingle, Searchlight, Ford.
 40374. Searchlight S. Co., Searchlight, Ford.
 40375. Gerald B. Hartley, Goldfield, Maxwell.
 40376. F. B. Headley, Fallon, Overland.
 40377. F. B. Headley, Fallon, Hupmobile.
 40378. F. W. Hicks, Fallon, Ford.
 40379. Dr. E. F. Derby, Fallon, Overland.
 40380. J. H. Deck, Pioche, Dodge.
 40381. J. H. Deck, Pioche, Ford.
 40382. Verdi Lumber Co., Reno, Federal.
 40383. Verdi Lumber Co., Reno, Ford.
 40384. Verdi Lumber Co., Reno, Ford.
 40385. Verdi Lumber Co., Reno, Ford.
 40386. Verdi Lumber Co., Reno, Ford.
 40387. Verdi Lumber Co., Reno, Ford.
 40388. Verdi Lumber Co., Reno, Ford.
 40389. Verdi Lumber Co., Reno, Hupmobile.
 40390. Geo. F. Willis, Yerington, Ford.
 40391. Kansas City Con. M. Co., Bruner, Ford.
 40392. Kansas City Con. M. Co., Bruner, Case.
 40393. H. W. Bruner, Bruner, King 8.
 40394. Wood Curtis Co., Reno, Ford.
 40395. Wood Curtis Co., Reno, Ford.
 40396. Wood Curtis Co., Reno, Ford.
 40397. C. S. Creakbaum, Mina, Chevrolet.
 40398. T. J. Reid, Reno, Chevrolet.
 40399. Rev. E. F. Jones, Reno, Ford.
 40400. A. B. Casey, Fallon, Chevrolet.
 40401. A. W. Matthews, Fallon, Oakland.
 40402. D. A. Williams, Fallon, Chevrolet.
 40403. Dave M. Trepp, Goldfield, Winton.
 40404. Jack Lowe, Sparks, Oldsmobile.
 40405. O. J. White, Goldfield, Ford.
 40406. B. I. Barlow, Goldfield, Ford.
 40407. B. I. Barlow, Goldfield, Ford.
 40408. Verdi Lumber Co., Lovelock, Ford.
 40409. John Fant, Lovelock, Cadillac.
 40410. E. B. Schlink, Reno, Oakland.
 40411. C. Murklinger, Reno, Oldsmobile.
 40412. R. Johnson, Reno, Chevrolet.
 40413. Mrs. C. G. Hankel, Reno, Nash.
 40414. A. M. Boyce, Yerington, Ford.
 40415. L. V. Smith, Reno, Oldsmobile.
 40416. F. M. Copezzali, Reno, Studebaker.
 40417. Geo. Liverato, Reno, Studebaker.
 40418. J. R. Turner, Sparks, Hudson.
 40419. E. N. Giffen, Reno, Oakland 6.
 40420. James Farrell, Wabuska, Chevrolet.
 40421. Geo. Parker, Wabuska, Reo.
 40422. Douglas J. Page, Reno, Overland.
 40423. J. D. Granata, Reno, Overland.
 40424. Arthur Gibson, Wonder, Ford.
 40425. Tim Hopper, Belmont, Ford.
 40426. Louis Sam, Round Mountain, Ford.
 40427. M. L. Davenport, Tonopah, Overland.
 40428. J. W. Berg, Round Mountain, Dodge.
 40429. P. Pedro (Indian), Tonopah, Ford.
 40430. Peter J. Meyer, Tonopah, Ford.
 40431. Comb. Divide M. Corp., Tonopah, Ford.
 40432. J. C. Bassett, Goodsprings, Ford.
 40433. W. N. Homan, Moapa, Ford.
 40434. Chas. Tibbs, Battle Mountain, Ford.
 40435. Henry Dildake, Montello, Dodge.
 40436. Dr. A. C. Olmsted, Wells, Dodge.
 40437. R. J. Pierson, Lovelock, Haynes.
 40438. James Ryan, Caliente, Ford.
 40439. Wm. Culverwell, Caliente, Ford.
 40440. Lincoln T. & F. Co., Pioche, Apperson.
 40441. Lincoln T. & F. Co., Pioche, Ford.
 40442. Lincoln T. & F. Co., Pioche, Ford.
 40443. Lincoln T. & F. Co., Pioche, Dodge.
 40444. Lincoln T. & F. Co., Pioche, Dodge.
 40445. Lincoln T. & F. Co., Pioche, Ford.
 40446. Wm. J. Crozier, Las Vegas, Studebaker.
 40447. Frank Lucas, Mason, Buick.
 40448. Mrs. F. E. Jackson, Mina, Ford.
 40449. C. A. Lawrence, Stillwater, Buick.
 40450. Walter Ashton, Fallon, Ford.
 40451. Alfred Freitas, Fallon, Chevrolet.
 40452. H. E. Smith, Fallon, Chevrolet.
 40453. Leo L. Likes, Fallon, Chevrolet.
 40454. R. G. Heritage, Fallon, Chevrolet.
 40455. L. F. Canterbury, Fallon, Chevrolet.
 40456. W. H. Caldwell, Fallon, Chevrolet.
 40457. Geo. Anderson, Sparks, Ford.
 40458. Nathan Bulaevalsky, Reno, Ford.
 40459. Mikado Laundry, Reno, Ford.
 40460. Mandalay Mines Co., Junco, Ford.
 40461. Martin Jensen, Sparks, Maxwell.
 40462. R. A. Trimble, Dayton, Overland.
 40463. A. M. Tailleux, Dayton, Chevrolet.
 40464. W. H. Scott, Dayton, Dodge.
 40465. L. E. Richter, Reno, Maxwell.
 40466. Obie Harrell, Fallon, Chevrolet.
 40467. Louis H. Dangberg, Wonder, Hudson.
 40468. J. K. Henderson, Wonder, Ford.
 40469. C. H. Cook, Fallon, Ford.
 40470. D. Santini, Wichman, Ford.
 40471. U. S. Reclamation Serv., Fallon, Ford.
 40472. Albert Kelly, Tonopah, Ford.
 40473. Truckee R. G. E. Co., Virginia, Dodge.
 40474. Truckee R. G. E. Co., Carson, Dodge.
 40475. Truckee R. G. E. Co., Yerington, Buick.
 40476. A. G. Reading, Wellington, Hummobile.
 40477. W. F. Reading, Wellington, King.
 40478. J. G. Freeman, Fernley, Buick.
 40479. H. W. Sommer, Lovelock, Ford.
 40480. F. L. Garavanta, Wadsworth, Ford.
 40481. Ellen & Richel, Fernley, Ford.
 40482. C. L. Montrose, Tonopah, Hupmobile.
 40483. W. A. Montrose, Tonopah, GMC.
 40484. J. A. Sellstrom, Tonopah, S-Booth.
 40485. H. D. Budelman, Tonopah, Chevrolet.
 40486. West End Con. M. Co., Tonopah, Ford.
 40487. West End Cons. M. Co., Tonopah, Chev.
 40488. West End C. M. Co., Tonopah, Signal.
 40489. West End C. M. Co., Tonopah, P-Arrow.
 40490. West End C. M. Co., Tonopah, P-Arrow.
 40491. West End C. M. Co., Tonopah, P-Arrow.
 40492. P. Kiley, Derby, Ford.
 40493. R. C. Davis, Fallon, Chevrolet.
 40494. H. A. Shellard, Fallon, Oakland.
 40495. W. A. Simmonds, Fallon, Overland.
 40496. J. B. Machin, Fallon, Hudson.
 40497. Barcellos Brothers, Mason, Ford.
 40498. Gruilli & Son, Yerington, Buick 6.
 40499. W. L. Foster, Goldfield, Jackson.
 40500. R. L. Foster, Goldfield, Buick 6.
 40501. R. L. Foster, Goldfield, Federal.
 40502. W. C. Bowman, Bunkerville, Ford.

- 40503....E. S. Funk, Fernley, Ford.
 40504....Robert J. Martin, Fernley, Chevrolet.
 40505....Roy Biddle, Fernley, Ford.
 40506....O. P. McGarr, Fernley, Maxwell.
 40507....T. J. Critchley, Elko, Dodge.
 40508....H. A. Nobles, Tonopah, Studebaker.
 40509....Andrew A. Lekva, Tonopah, Ford.
 40510....Charles C. Starr, Tonopah, Dodge.
 40511....J. P. Kennison, Tonopah, Oakland.
 40512....William A. Marshall, Austin, Chandler.
 40513....M. W. Malloy, Austin, Overland.
 40514....M. W. Malloy, Austin, Ford.
 40515....Benj. Barbash, Reno, Cadillac 8.
 40516....A. F. Price, Reno, Ford.
 40517....Geo. Downey, Reno, Ford.
 40518....Frank Stupka, Reno, Overland.
 40519....Nev. Products Co., Reno, Chevrolet.
 40520....Nev. Products Co., Reno, Ford.
 40521....Nev. Products Co., Reno, Ford.
 40522....Nev. Products Co., Reno, Ford.
 40523....Mrs. Mary Brewington, Reno, Oakland.
 40524....S. Ramelli, Reno, Oakland.
 40525....A. E. Painter, Reno, Chevrolet.
 40526....J. H. Stotesbury, Reno, Studebaker.
 40527....Washington Irvine, Reno, Ford.
 40528....W. B. Bridgman, Reno, Case 30.
 40529....F. E. Lincoln, Reno, Oldsmobile.
 40530....F. C. Beedle, Reno, Cadillac.
 40531....John Z. Shalter, Reno, Ford.
 40532....John A. Shalter, Reno, Ford.
 40533....M. A. Nelsen, Yerington, Overland.
 40534....A. J. Stankey, Sparks, Chevrolet.
 40535....Wm. K. Smith, Sparks, Dodge.
 40536....Martin P. Geraghty, Sparks, Buick.
 40537....M. J. Burr, Carson, Chevrolet.
 40538....Flesey Ambroseiti, Carson, Overland.
 40539....Joe Frugoli, Mound House, Haynes.
 40540....J. L. Hardwick, Silver City, Dodge.
 40541....F. H. Menzel, Gardnerville, Dodge.
 40542....F. Schlomberg, Silver City, Buick 4.
 40543....Ada Irene James, Reno, Overland.
 40544....F. E. Tailleux, Dayton, Buick.
 40545....Percival Nash, Reno, Dodge.
 40546....Mrs. C. Sprague, Carson, Cadillac.
 40547....R. Sunday, Carson City, Ford.
 40548....Chas. G. Hurlie, Reno, Dodge.
 40549....Herbert Jester, Goldfield, Ford.
 40550....B. M. Stout, Goldfield, Pope Hartford.
 40551....Oscar Pihl, Tonopah, Oakland.
 40552....J. F. Murphy, Austin, Oakland.
 40553....J. W. Laufman, Reno, Ford.
 40554....Nick Bardella, Reno, Ford.
 40555....J. D. Grant, Tonopah, Lexington.
 40556....C. F. Barker, Reno, Chevrolet.
 40557....A. D. Geer, Alamo, Ford.
 40558....J. W. Butcher, Reno, Reo.
 40559....Mrs. C. McTigue, Silver City, Hudson.
 40560....N. Barenko, Reno, Oldsmobile.
 40561....Pearl Edwards Smith, Reno, Nash.
 40562....B. A. Jacobi, Reno, Oakland.
 40563....Hank Prinz, Fallon, Ford.
 40564....A. J. Juhl, Round Mountain, Ford.
 40565....Wm. Poch, Wellington, Chevrolet.
 40566....Chas. A. Schuman, Wellington, Chev.
 40567....Geo. C. Hunting, Reno, Dodge.
 40568....C. E. Wedertz, Wellington, Hudson.
 40569....Ed. Beckman, Nelson, Metz.
 40570....John N. Hudgens, Searchlight, Ford.
 40571....Wm. Barkhart, Goodsprings, Ford.
 40572....J. D. Van Vleet, Pioche, Ford.
 40573....Frank W. Taylor, Tonopah, Buick.
 40574....A. W. Swan, Reno, Dodge.
 40575....Ona Cordill, Reno, Buick.
 40576....L. Mongolo, Sparks, Oakland.
 40577....W. E. Cobb, Reno, Buick.
 40578....Robert Valcelda, Reno, Buick.
 40579....A. O. Hiatt, Las Vegas, Ford.
 40580....Eason Bros., Fallon, Maxwell.
 40581....John H. Eason, Fallon, Dort.
 40582....Reg Meaker, Reno, Buick.
 40583....G. S. Baughn, Fallon, Buick.
 40584....C. M. Damm, Lovelock, Dort.
 40585....A. L. McFadden, Fallon, Ford.
 40586....Hunter & Banks Co., Elko, Franklin.
 40587....Hunter & Banks Co., Elko, Oldsmobile.
 40588....Peter Duffey, Tonopah, Overland.
 40589....Mrs. A. J. D'Arcy, Goldfield, Cadillac.
 40590....W. H. Berg, Round Mountain, Ford.
 40591....W. H. Berg, Round Mountain, Ford.
 40592....W. H. Berg, Round Mountain, Ford.
 40593....R. A. Belcher, Round Mountain, Buick.
 40594....A. T. Stone, Carlin, Dodge.
 40595....Frank Hopely, Elko, Dodge.
 40596....Kenneth McGee, Reno, Ford.
 40597....Joe Mozetti, Reno, Studebaker.
 40598....Mrs. May L. Gignoux, Reno, Maxwell.
 40599....A. J. Hanson, Lovelock, Buick.
 40600....E. W. Blair, Tonopah, Chandler.
 40601....Walker L. Boone, Stewart, Chevrolet.
 40602....Geo. Kennedy, Lovelock, Dort.
 40603....Mrs. Frank Coffin, Hazen, Cadillac.
 40604....Claude W. Looz, Lovelock, Ford.
 40605....H. G. McMahon, Goldfield, Buick.
 40606....Cracker Jack M. Co., Goldfield, Buick.
 40607....Floyd R. Couch, Fallon, Ford.
 40608....Schreck Bros., Smith, Dodge.
 40609....Frank E. Black, Las Vegas, Ford.
 40610....O. W. LeMay, Fernley, Ford.
 40611....J. L. Wightman, Fallon, Elgin.
 40612....Wm. E. Hammond, Ursine, Ford.
 40613....Samuel R. Cord, Indian Springs, Ford.
 40614....Irvin A. Hanson, Lovelock, Ford.
 40615....Key Pittman, Tonopah, Franklin.
 40616....Geo. Q. Dickie, Reno, Ford.
 40617....Peter Finn, Reno, Ford.
 40618....W. H. Hood, M.D., Reno, Hudson.
 40619....Wm. Acklin, Caliente, Ford.
 40620....F. N. Haight, Las Vegas, Dodge.
 40621....Sam McElanahan, Goodsprings, Ford.
 40622....Glenn H. Trout, Las Vegas, Ford.
 40623....Herman Ernst, Tonopah, Studebaker.
 40624....Henry A. Williams, Yerington, Reo.
 40625....Bluestone M. & S. Co., Mason, Marmon.
 40626....Dr. R. A. Bowdle, East Ely, Dodge.
 40627....J. R. Williams, Goodsprings, Overland.
 40628....O. S. Lodwick, Beatty, Ford.
 40629....A. S. Hall, Beatty, Paige.
 40630....G. F. Harris, Reno, Chandler.
 40631....Dr. John Tees, Reno, Oldsmobile.
 40632....John G. Taylor, Lovelock, Ford.
 40633....John G. Taylor, Lovelock, Ford.
 40634....John G. Taylor, Lovelock, Ford.
 40635....John G. Taylor, Lovelock, Willys-K.
 40636....John G. Taylor, Lovelock, Dodge.
 40637....John G. Taylor, Lovelock, Marmon.
 40638....John G. Taylor, Lovelock, Hudson.
 40639....John G. Taylor, Lovelock, Buick.
 40640....John G. Taylor, Lovelock, Buick.
 40641....John G. Taylor, Lovelock, Buick.
 40642....John G. Taylor, Lovelock, Buick.
 40643....D. G. Christen, Winnemucca, Ford.
 40644....Mrs. John Doyle, Lovelock, Dodge.
 40645....Fred Craig, Tonopah, Hupmobile.
 40646....C. A. Gelmstedt, Reno, Buick.
 40647....Chas. W. Adams, Lovelock, Ford.
 40648....John Anderson, Lovelock, Reo 5.
 40649....A. Reno, Lovelock, Reo.
 40650....Nelson Jensen, Lovelock, Reo.
 40651....Frank Crumpacker, Lovelock, Ford.
 40652....S. E. Archibald, Reno, Cadillac.
 40653....M. B. Moore, Reno, Haynes.
 40654....Frank Howard, Empire, Ford.
 40655....W. C. Bowman, Bunkerville, Overland.
 40656....Reno Flour Mill Co., Reno, Cole 8.
 40657....Reno Flour Mill Co., Reno, Garfield.
 40658....Reno Flour Mill Co., Reno, Ford.
 40659....Peter Thomsen, Reno, Overland.
 40660....Ferdinand Beck, Virginia City, Dodge.
 40661....Missing.
 40662....Crown Pt. Globe M. Co., Johnny, Ford.
 40663....T. O. Ward, Reno, Oldsmobile.
 40664....R. L. Douglass, Fallon, Ford.
 40665....R. L. Douglass, Fallon, Ford.
 40666....R. L. Douglass, Fallon, Hudson.
 40667....Wm. Penrose, Reno, Ford.
 40668....C. W. Pierce, Reno, Ford.
 40669....Frank Gallery, Reno, Ford.
 40670....Wm. Penrose, Reno, Ford.
 40671....E. M. Dobbs, Reno, Ford.
 40672....J. P. Fitzgerald, Gardnerville, Buick.
 40673....Mrs. C. W. Hawkins, Genoa, Ford.
 40674....Ypparraguirre Bros., Sweetwater, Hns.

- 40675.....Cremmer & Erickson Co., Yerington, Reno.
 40676.....J. M. Damon, Dayton, Chevrolet.
 40677.....Carrie S. L. M. Corp, Tonopah, Dodge.
 40678.....John Beterbide, Lovelock, Ford.
 40679.....Morris Nelson, Lovelock, Ford.
 40680.....Geo. D. Ernst, Fallon, Chandler.
 40681.....Geo. D. Ernst, Fallon, Ford.
 40682.....J. D. Mercer, Humboldt House, Ford.
 40683.....Lester W. Hanson, Lovelock, Ford.
 40684.....Mrs. Clarence Guest, Tonopah, Buick.
 40685.....J. D. Barry, Tonopah, Ford.
 40686.....R. Drew, Reno, Essex.
 40687.....Gustaf Shavee, Olinghouse, Ford.
 40688.....Goodsprings Anchor Co., Jean, Ford.
 40689.....W. F. Rannels, Sparks, Ford.
 40690.....James Jepsen, Sparks, Ford.
 40691.....Mark Walker, Reno, Lexington.
 40692.....B. G. Yarn, Reno, Chandler.
 40693.....Dell Brown, Tonopah, Ford.
 40694.....Joseph Meyer, Tonopah, Hudson.
 40695.....L. O. Ray, Tonopah, Ford.
 40696.....F. A. Schlanser, Goldfield, Lexington.
 40697.....W. B. Mundy, Las Vegas, Maxwell.
 40698.....C. L. Richards, Reno, Jordan.
 40699.....Nevada Packing Co., Reno, Chevrolet.
 40700.....H. H. Murray, Reno, Maxwell.
 40701.....Victory Divide M. Co., Goldfield, Cad.
 40702.....Jack Farrell, Reno, Hudson 6.
 40703.....Mrs. M. J. Mawer, Reno, Studebaker.
 40704.....B. Patrone, Verdi, Ford.
 40705.....Masha Ratner, Reno, Ford.
 40706.....H. C. Leavitt, Reno, Ford.
 40707.....Walter Hansen, Reno, Ford.
 40708.....Chas. V. Knight, Reno, Ford.
 40709.....Hugh E. Widaman, Sparks, Ford.
 40710.....Wm. S. Welsh, Reno, Maxwell.
 40711.....C. McQuarry, Reno, Buick.
 40712.....E. E. Caine, Elko, Dodge.
 40713.....Gilbert Bros., Reno, Ford.
 40714.....Frank Poles, Pioche, Chevrolet.
 40715.....H. P. Kruse, Lovelock, Studebaker.
 40716.....Paul Garson, Reno, Reno.
 40717.....Angello Oppio, Reno, Reno.
 40718.....Frank E. Parker, Sparks, Dort.
 40719.....Geo. A. Scott, Reno, Hudson Super 6.
 40720.....Geo. A. Scott, Reno, Packard.
 40721.....Geo. A. Scott, Reno, Hudson Super 6.
 40722.....Harry R. Bischoff, Mason, Studebaker.
 40723.....T. G. Nichol, Wabuska, Ford.
 40724.....Ed. Tanner, Yerington, White.
 40725.....C. A. Horn, DeLamar, Ford.
 40726.....Jos. H. Arthur, Reno, Chevrolet.
 40727.....Louis D. Piretto, Reno, Ford.
 40728.....A. Bennett, Fallon, Maxwell.
 40729.....Col. J. P. Ryan, Reno, Overland.
 40730.....J. H. Young, Ruth, Ford.
 40731.....Stephoe Valley Hospital, E. Ely, Packrd.
 40732.....Stephoe Valley Hospital, E. Ely, Kisl.
 40733.....Tom Vicondo, Winnemucca, Overland.
 40734.....W. Armstrong, Winnemucca, Ford.
 40735.....Pat Lorenzana, Winnemucca, Ford.
 40736.....Chas. Pedrol Est., Winnemucca, Ford.
 40737.....Pete Etchevoyhen, Kennedy, Ford.
 40738.....Joe Horvath, Paradise, Ford.
 40739.....Robert Hanson, Paradise, Ford.
 40740.....Joaquin Elizondo, Winnemucca, Olds.
 40741.....J. A. White, Winnemucca, Ford.
 40742.....O. C. Dickinson, Reno, Haynes.
 40743.....C. H. Knox, Reno, Haynes.
 40744.....C. Berquist, Reno, Ford.
 40745.....M. Samoville, Reno, Hupmobile.
 40746.....C. E. Flagg, Reno, Hupmobile.
 40747.....S. C. Foster, Reno, Essex.
 40748.....Dr. S. K. Morrison, Reno, Hudson.
 40749.....Carlo Granata, Reno, Chalmers.
 40750.....William Irving, Goodsprings, Ford.
 40751.....Richard Munzberg, Goodsprings, Ford.
 40752.....G. H. McCormick, Lovelock, Oldsmobl.
 40753.....G. H. McCormick, Lovelock, Ford.
 40754.....Hans Westgard, Lovelock, Ford.
 40755.....Joseph Miller, Battle Mountain, Ford.
 40756.....Jack Johnnie, Wonder, Ford.
 40757.....Georgia E. Hill, Fallon, Ford.
 40758.....Thos. Inglis, Fallon, Ford.
 40759.....Chauncey W. Smith, Fallon, Ford.
 40760.....Mrs. A. B. McKinley, Reno, Ford.
 40761.....Dr. Victor W. Poulsen, Reno, Dodge.
 40762.....Frank Lushbaugh, Reno, Hupmobile.
 40763.....John Z. Shalter, Reno, Ford.
 40764.....John Z. Shalter, Reno, Buick.
 40765.....George R. Emery, Reno, Cadillac.
 40766.....J. R. Tait, Reno, Ford.
 40767.....Chester J. Dormio, Reno, Nash.
 40768.....Chester J. Dormio, Reno, Ford.
 40769.....Shober J. Rogers, Fallon, Overland.
 40770.....G. C. Rogers, Fallon, Ford.
 40771.....Chester J. Dormio, Reno, Ford.
 40772.....Chester J. Dormio, Reno, Ford.
 40773.....F. E. Jones, Goldfield, Overland.
 40774.....C. C. Crone, Montello, Dodge.
 40775.....Elmer Hendricks, Montello, Ford.
 40776.....C. E. Kent, Stillwater, Chandler.
 40777.....Emmet D. Boyle, Carson City, Reno.
 40778.....Oscar Swanson, Fallon, Buick.
 40779.....W. W. Sanford, Fallon, Oldsmobile.
 40780.....C. E. Kent, Stillwater, Dodge.
 40781.....Reno T. & T. Co., Reno, Ford.
 40782.....Reno T. & T. Co., Reno, Ford.
 40783.....Reno T. & T. Co., Reno, Ford.
 40784.....Agnes Compton, Yerington, Ford.
 40785.....Adam Patterson Co., Dyer, Buick.
 40786.....Geo. Marchmont, Millers, Ford.
 40787.....P. Gennette, Elko, Kissel.
 40788.....W. M. Weathers, Elko, Franklin.
 40789.....Mrs. Edna M. Furlong, Elko, Overland.
 40790.....Arthur Pursel, Yerington, Buick.
 40791.....P. Dominici, Yerington, Studebaker.
 40792.....H. W. Ruppert, Fallon, Ford.
 40793.....Eddie Ruebe, Minden, Cadillac.
 40794.....C. G. Russell, Gardnerville, Briscoe.
 40795.....J. A. Somers, Mason, Chevrolet.
 40796.....Ernest L. Woodman, Las Vegas, Lozier.
 40797.....George W. Lund, Searchlight, Overland.
 40798.....Colman Rowse, Montello, Ford.
 40799.....John Hill, Montello, Ford.
 40800.....Arthur J. Hood, Elko, Studebaker.
 40801.....W. S. Raine, Palisade, Buick.
 40802.....Pioche Mines Co., Pioche, Ford.
 40803.....Pioche Mines Co., Pioche, Ford.
 40804.....Herman Miller, Gardnerville, Overland.
 40805.....H. D. Neddenriep, Minden, Oldsmobile.
 40806.....John Hellwinkel, Gardnerville, Chev.
 40807.....Joe Anderson, Gardnerville, Ford.
 40808.....Victor Bull, Gardnerville, Ford.
 40809.....William Lampe, Gardnerville, Case.
 40810.....William Lampe, Gardnerville, Case.
 40811.....Clarence Park, Gardnerville, Overland.
 40812.....P. Peterson, Gardnerville, Briscoe.
 40813.....Louis Filmore, Gardnerville, Ford.
 40814.....W. Howell, M.D., Gardnerville, Overland.
 40815.....Geo. Montrose, Gardnerville, Overland.
 40816.....Mrs. Emma Simonis, Minden, Ford.
 40817.....John Biagge, Sheridan, Ford.
 40818.....Ernest Bockelman, Sheridan, Ford.
 40819.....A. S. Thompson Co., Pioche, Ford.
 40820.....A. S. Thompson Co., Pioche, Olds. 37-2.
 40821.....A. S. Thompson Co., Pioche, Ford.
 40822.....L. A. Sydal, Reno, Maxwell.
 40823.....O. Hovenden, East Ely, Ford.
 40824.....D. D. Ogilvie, Elko, Ford.
 40825.....Associated Cleaners, Reno, Ford.
 40826.....Edward Carmody, Reno, Chevrolet.
 40827.....M. A. Robison, M.D., Reno, Oakland.
 40828.....J. A. Nyswander, Reno, Ford.
 40829.....Mrs. Grell, Reno, Oldsmobile.
 40830.....Dr. McKenzie, Reno, Studebaker.
 40831.....W. F. Edwards, Reno, Overland.
 40832.....Geo. T. Crosby, Reno, Mitchell.
 40833.....Myrtle L. Hawkins, Reno, Hudson.
 40834.....G. H. Mullison, Reno, Chevrolet.
 40835.....Dr. J. W. Hoffman, Fallon, Ford.
 40836.....R. C. Mabson, Reno, Ford.
 40837.....Jas. W. Stewart, Tonopah, Ford.
 40838.....A. L. Pierce, Delano, Ford.
 40839.....Fred Sheldon, Lovelock, Ford.
 40840.....Joe Moe, Fernley, Ford.
 40841.....Joe Garavanta, Wadsworth, Buick.
 40842.....Gaston Bros., Wellington, Dodge.
 40843.....A. C. Sayre, Smith, Dodge.
 40844.....Joe P. Johnson, Lovelock, Buick.
 40845.....Mrs. C. W. Myers, Lovelock, Ford.
 40846.....J. A. Henrikson, Lovelock, Ford.

- 40847...Jack Frey, Reno, Ford.
 40848...C. Lava Guino, Reno, Ford.
 40849...W. W. Wright, Reno, Ford.
 40850...N. E. Cooper, Reno, Ford.
 40851...John Avansano, Reno, Ford.
 40852...J. T. Bisagno, Reno, Ford.
 40853...Geo. Barrett, Yerington, Reo.
 40854...Richard Bate, McGill, White.
 40855...Frank Grove, Carrara, Ford.
 40856...E. E. Palmer, Beatty, Overland.
 40857...Cyrus Johnson, Beatty, Overland.
 40858...T. & T. R. R. Co., Goldfield, Dodge.
 40859...C. Heitman, Gardnerville, Briscoe.
 40860...A. Bindewald, Derby, Ford.
 40861...Otto Merten, Goodsprings, Ford.
 40862...J. L. Wollam, Reno, Ford.
 40863...E. P. Walker, Lovelock, Ford.
 40864...J. P. Baker, Fallon, Overland.
 40865...J. B. McKnight, Imlay, Studebaker.
 40866...J. A. Wright, Tonopah, Ford.
 40867...Richard Cannonica, Genoa, Ford.
 40868...Chas. Giardelli, Genoa, Ford.
 40869...W. K. Ball, Washoe, Ford.
 40870...C. L. Falcke, Genoa, Ford.
 40871...P. J. McCort, Washoe, Ford.
 40872...C. C. Cottrell, Carson, Cadillac.
 40873...C. C. Cottrell, Carson, Buick.
 40874...Walter E. Hanson, Lovelock, Reo.
 40875...Morris & Levy, Reno, Ford.
 40876...E. J. Erickson, Tonopah, Hudson.
 40877...John Rosasco, Reno, Buick.
 40878...James Buckley, Golconda, Overland.
 40879...Chas. A. Hudgens, Searchlight, Buick.
 40880...Joe Scerine, Yerington, Buick.
 40881...Manuel Silva, Yerington, Buick.
 40882...R. H. Hooper, Mason, Chevrolet.
 40883...A. Hankhammer, Verdi, Hupmobile.
 40884...J. B. Daniel, Lovelock, Oakland.
 40885...Rex A. Crider, Reno, Buick.
 40886...Azores Merc. Co., Lovelock, Ford.
 40887...W. T. Roberts, Nixon, Ford.
 40888...Duane Freeman, Verdi, Ford.
 40889...C. L. Harkins, Ely, Ford.
 40890...W. H. Braden, Goldfield, Ford.
 40891...Dr. Thos. H. Sufall, Ely, Cadillac.
 40892...Frank Roper, East Ely, Buick.
 40893...Chas. T. Sorgi, Reno, Ford.
 40894...Mrs. G. W. Rogers, Simpson, Dodge.
 40895...Sarah Rallens, Wabuska, Ford.
 40896...S. M. DeBelt, Pioche, Ford.
 40897...Julius Fannoci, Yerington, Ford.
 40898...Utah Constr. Co., Montello, Buick.
 40899...C. M. Ross, Winnemucca, Ford.
 40900...Ruel E. Lothrop, Yerington, Overland.
 40901...N. F. Bertrand, Yerington, Buick.
 40902...Joseph Wilson, Jr., Yerington, Buick.
 40903...Con Alexander, Yerington, Grant.
 40904...Rev. Jos. Cunha, Yerington, Overland.
 40905...Marcella Ricardo, Yerington, Ford.
 40906...C. Metz, Yerington, Briscoe.
 40907...Lloyd Lamberson, Yerington, Chandler.
 40908...F. S. Lamberson, Yerington, Chandler.
 40909...Clark J. Guild, Yerington, Buick.
 40910...G. H. Plummer, Yerington, Dodge.
 40911...F. O. Stickney, Yerington, Dodge.
 40912...F. O. Stickney, Yerington, Dodge.
 40913...Fred Strosnider, Yerington, Buick.
 40914...G. W. Martin, Yerington, Overland.
 40915...W. H. Young, Wabuska, Ford.
 40916...Minnie Robinson, Mason, Ford.
 40917...W. A. Pursel, Yerington, Buick 6.
 40918...F. M. Burner, Yerington, Oldsmobile.
 40919...G. S. Williams, Yerington, Studebaker.
 40920...John A. Dixon, Yerington, Ford.
 40921...E. F. Knemeyer, Yerington, Overland.
 40922...F. E. Martin, Yerington, Ford.
 40923...A. H. Rhoads, Yerington, Ford.
 40924...Joe Wilson, Sr., Yerington, Buick 6.
 40925...D. Paquint, Yerington, Saxon.
 40926...Fanny D. Guttery, Yerington, Dodge.
 40927...C. R. Edison, Yerington, Reo.
 40928...O. A. Perry, Yerington, Buick 4.
 40929...W. W. Edwards, Mason, Ford.
 40930...W. W. Edwards, Mason, Ford.
 40931...Elwood Luce, Yerington, Lexington.
 40932...H. C. Keema, Yerington, Dodge.
 40933...Pete Chasseur, Wabuska, Ford.
 40934...F. W. Greiner, Reno, Ford.
 40935...W. F. McDonald, Reno, Ford.
 40936...C. L. Crane, Reno, Ford.
 40937...E. F. Jones, Reno, Ford.
 40938...J. O. Sessions, Reno, Ford.
 40939...E. F. Lent, Sparks, Ford.
 40940...Hugh Holstrom, Verdi, Ford.
 40941...Louis Zint, Reno, Ford.
 40942...John Deere Plow Co., Reno, Dodge.
 40943...Mrs. Ed. Swanson, Washoe, Chevrolet.
 40944...Klaus, Creps & Heitman, Reno, Okland.
 40945...C. L. Connelly, Las Vegas, Ford.
 40946...Leslie Evans, Reno, Ford.
 40947...F. C. Davidson, Lovelock, Chevrolet.
 40948...W. H. Menke, Reno, Buick.
 40949...Swift & Co., Reno, Ford.
 40950...Mrs. Ruth Edises, Reno, Ford.
 40951...Eugene L. Dutertre, Golconda, Overland.
 40952...L. Lewis, Winnemucca, Crow Elkhart.
 40953...O. O. Horner, Winnemucca, Maxwell.
 40954...A. N. Bliefeldt, Low, Rochester, Ford.
 40955...A. Loose, Lovelock, Franklin.
 40956...Ben J. Sears, Imlay, Ford.
 40957...Nev. Fish & Game Com., Verdi, Ford.
 40958...Nick Abelman, Tonopah, Buick.
 40959...Mayme T. Smith, Tonopah, Stutz.
 40960...S. H. Fort, Fallon, Ford.
 40961...S. H. Fort, Fallon, Ford.
 40962...Felix Ripa, Fallon, Saxon.
 40963...Ed. F. Durbar, Fallon, Oldsmobile.
 40964...A. A. Smith, Wonder, Ford.
 40965...B. Buscaglia, Goldfield, Maxwell.
 40966...Henry Bowling, Pioche, Ford.
 40967...Frank Walker, Pioche, Ford.
 40968...M. H. Parks, Fallon, Ford.
 40969...C. N. Stevenson, East Ely, Dodge.
 40970...W. D. Warren, Urside, Ford.
 40971...Chas. H. Cress, Fallon, Dodge.
 40972...Joe Wilson, Fallon, Ford.
 40973...Verdi Lumber Co., Fallon, Hupmobile.
 40974...R. R. Gamble, Hazen, Ford.
 40975...R. R. Gamble, Lovelock, Ford.
 40976...Geo. Herberth, Sparks, Studebaker.
 40977...P. T. Anderson, Fernley, Ford.
 40978...W. A. Hardy, Fernley, Ford.
 40979...Nev. Bee & Honey Co., Lovelock, Ford.
 40980...Nev. Bee & Honey Co., Lovelock, Ford.
 40981...Nev. Bee & Honey Co., Lovelock, Ford.
 40982...R. S. Bechtel, Lovelock, Buick.
 40983...J. D. Mason, Mason, Ford.
 40984...A. G. Cummings, Goldfield, Studebaker.
 40985...Achille Petrucci, Goldfield, Oakland.
 40986...Christopher Piri, Reno, Ford.
 40987...C. E. Bartlett, Fallon, Chevrolet.
 40988...C. E. Towle, Fallon, Oldsmobile.
 40989...A. A. Towle, Fallon, Chevrolet.
 40990...N. H. Van Alstine, Yerington, Hup.
 40991...J. C. Gallagher, Yerington, Ford.
 40992...Fred J. Brooks, Yerington, Ford.
 40993...George Rice, Wabuska, Buick 6.
 40994...Peter Gallagher, Wabuska, Buick 4.
 40995...Robert Sloan, Yerington, Ford.
 40996...Yerington Creamery, Yerington, Ford.
 40997...Thos. Axelson, Mina, Ford.
 40998...Mrs. A. L. Zerangue, Reno, Stutz.
 40999...R. Patrone, Verdi, Dodge.
 41000...W. L. Beawick, Reno, Ford.
 41001...J. M. Orcio, Reno, Chevrolet.
 41002...Langley & Michaels Co., Reno, Dodge.
 41003...Chas. Schiller, Reno, Ford.
 41004...H. E. Benson, Reno, Buick.
 41005...Tobias Boel, Reno, Chevrolet.
 41006...B. F. Corder, Yerington, Chevrolet.
 41007...C. M. Carter, Smith, Ford.
 41008...Thos. Rowe, Smith, Ford.
 41009...Martin Schaub, Fernley, Ford.
 41010...E. M. Pierson, Wadsworth, Ford.
 41011...Howard Pratt, Fernley, Dort.
 41012...David S. Farnsworth, Las Vegas, Ford.
 41013...W. E. Ferron, Las Vegas, Hupmobile.
 41014...Harry E. Steiger, Las Vegas, Ford.
 41015...M. M. Riley, Las Vegas, Overland.
 41016...John C. Thornton, Reno, Ford.
 41017...O. E. Kibble, Reno, Hupmobile.
 41018...William M. Rogers, Fallon, Ford.
 41019...Roy Jas. Casey, Fallon, Ford.
 41020...Goodyear Tire Co., Reno, Dodge.

- 41021...Gold Canyon Drg. Co., Dayton, Buick.
 41022...Gold Canyon Drg. Co., Dayton, Kibr.
 41023...Calvin E. Davis, Sparks, Essex.
 41024...John DeKinkor, Lovelock, Ford.
 41025...J. A. Caveney, Rochester, Ford.
 41026...Gus Sund, Lovelock, Chevrolet.
 41027...Gold Reef Divide Co., Tonopah, Ford.
 41028...D. L. Carpenter, Lovelock, Ford.
 41029...Geo. L. Boyson, Reno, Ford.
 41030...J. G. Mihlitch, Tonopah, Ford.
 41031...Chas. F. Heinz, Chilcoot, Cal., Ford.
 41032...Mrs. M. L. Heinz, Chilcoot, Cal., Ford.
 41033...Al. James, Las Vegas, King 8.
 41034...Leo A. McNamee, Las Vegas, Dodge.
 41035...P. M. Housman, Las Vegas, Ford.
 41036...L. P. McKelvey, Tonopah, Cadillac.
 41037...Jack Reynolds, Las Vegas, Ford.
 41038...J. H. Thomas, Goldfield, Studebaker.
 41039...Goldfield Cons. W. Co., Goldfield, Ford.
 41040...Goldfield W. Co., Goldfield, Assembled.
 41041...A. C. Otners, Goldfield, Ford.
 41042...R. C. Faulkner, Montello, Saxon.
 41043...J. H. Keyser, Elko, Oldsmobile.
 41044...J. L. Keyser, Elko, Oldsmobile.
 41045...Mrs. M. C. Howe, Reno, Chevrolet.
 41046...H. Ginsburg, Reno, Reo.
 41047...L. C. Griffin, Reno, Buick.
 41048...T. C. Hart, Fallon, Buick.
 41049...Chas. Howser, Fallon, Ford.
 41050...Abraham Endsley, Fallon, Ford.
 41051...Albert Modeen, Tonopah, Dodge.
 41052...Fred Kern, Fallon, Oakland.
 41053...Williams Estate Co., Fallon, Pierce Ar.
 41054...Rhoda L. Laube, Tonopah, Dodge.
 41055...Henry Carney, Yerington, Ford.
 41056...P. Capurro, Reno, Haynes.
 41057...H. C. Heidtman, Reno, Buick.
 41058...H. C. Heidtman, Reno, Sears.
 41059...H. C. Heidtman, Reno, Cadillac.
 41060...W. S. Goodwin, Las Vegas, Hupmobile.
 41061...Manual Avela, Reno, Ford.
 41062...W. P. Young, Reno, Hudson.
 41063...J. G. Thomas, Reno, Ford.
 41064...G. K. Collins, Lida, Studebaker.
 41065...Sam Snyder, Lida, Ford.
 41066...Wm. Genzel, Yerington, Ford.
 41067...B. F. Webster, Jr., Mason, Chevrolet.
 41068...L. D'A Prince, Reno, Buick.
 41069...Henry Schubert, Round Mtn., Ford.
 41070...M. E. Cesana, Oreana, Studebaker.
 41071...W. Paulsen, Round Mtn., Dodge.
 41072...A. E. Lowe, Tonopah, Essex.
 41073...Rev. C. Bache, Elko, Ford.
 41074...Walter C. Bean, Bruner, Ford.
 41075...Elko-Lamolle P. Co., Elko, Overland.
 41076...C. B. Burr, Fallon, Dodge.
 41077...F. L. Gora, Goldfield, Overland.
 41078...Casper Oberdorger, Goldfield, Chandler.
 41079...Joe Marcotte, Goldfield, Ford.
 41080...W. A. Ingalls, Goldfield, Ford.
 41081...Robt. Puez, Goodsprings, Ford.
 41082...Amento Mariconi, Yerington, Ford.
 41083...States M. C. M. Co., Searchlight, Ford.
 41084...Silas E. Ross, Reno, Sayres-Scoville.
 41085...Perkins Gulling Co., Reno, Cadillac.
 41086...Perkins Gulling Co., Reno, Studebaker.
 41087...Perkins Gulling Co., Reno, Studebaker.
 41088...Silas E. Ross, Reno, Houghton.
 41089...L. Etchepare, Reno, Buick.
 41090...Adolph Polloestrini, Sparks, Maxwell.
 41091...Jno. A. Raffetto, Reno, Oakland.
 41092...B. Capurro, Sparks, Oakland.
 41093...St. John Laborde, Austin, Oldsmobile.
 41094...Joe Martinelli, Yerington, Overland.
 41095...William Cann, Reno, Mitchell.
 41096...Mrs. Minnie Jewell, Reno, Buick.
 41097...Geo. A. Payle, Est., Jean, Buick.
 41098...Geo. A. Payle, Est., Jean, White.
 41099...U. S. Indian Service, Reno, Ford.
 41100...U. S. Indian Service, Reno, Oakland.
 41101...Burkham Savini, Yerington, Ford.
 41102...F. J. Shair, Reno, Buick.
 41103...Harry Records, Reno, Studebaker.
 41104...T. B. Connolly, Goodsprings, Ford.
 41105...S. D. Conger, Overton, Overland.
 41106...O. Kattenhorn, Battle Mtn., Chalmers.
 41107...Mrs. G. M. Bidleman, Lovelock, Stubbk.
 41108...Mrs. W. A. Lee, Battle Mtn., Dodge.
 41109...Alfred K. Hansen, Fernley, Ford.
 41110...D. A. Washburn, Fernley, Ford.
 41111...Ed. Malley, Carson, Buick.
 41112...C. F. Goegg, Wadsworth, Ford.
 41113...Pastor Niriarty, Lovelock, Overland.
 41114...Charles E. Mooser, Reno, Cadillac.
 41115...F. W. McKee, Tonopah, Ford.
 41116...Dave Gardella, Wadsworth, Maxwell.
 41117...W. B. Borden, Sparks, Chevrolet.
 41118...Frank Jones, Fernley, Buick.
 41119...Chas. Nelson, Reno, Oakland.
 41120...Ernest Rabe, Carson City, Ford.
 41121...Henry E. Cahill, Sparks, Hupmobile.
 41122...Wm. W. Coleman, Carson, Ford.
 41123...F. V. McAvoy, Reno, Cadillac.
 41124...Mrs. Hamlen, Hawthorne, Studebaker.
 41125...Johnson & Graham, Verdi, Dodge.
 41126...Giuseppe Dini, Yerington, Ford.
 41127...Chas. Taylor, Carson, Little Giant.
 41128...Randall W. Dickinson, Fallon, Ford.
 41129...Frank W. Orr, Reno, Chevrolet.
 41130...John J. Ward, Reno, Dodge.
 41131...Geo. W. Greiner, Reno, Ford.
 41132...Arthur H. Connell, Las Vegas, Hudson.
 41133...G. Ceresola, Reno, Buick.
 41134...J. L. McCaffery, Goodsprings, Ford.
 41135...Chas. C. Blaker, Tonopah, Ford.
 41136...Cadlini Brothers, Derby, Dodge.
 41137...Amedeo Moncarini, Yerington, Ford.
 41138...A. J. Boast, Sparks, Ford.
 41139...Cless C. Wandeburg, Tonopah, Ford.
 41140...J. M. Gilfoyle, Tonopah, Buick.
 41141...C. B. Moore, Deeth, Dodge.
 41142...Marius Peterson, Reno, Ford.
 41143...Preston B. Smith, Reno, Ford.
 41144...D. H. Updike, Reno, Reo.
 41145...Smith & Petersen, Reno, Federal.
 41146...Smith & Petersen, Reno, Mack.
 41147...H. G. Seibold, Sparks, Maxwell.
 41148...R. M. Stewart, Reno, Liberty.
 41149...Andrew Nelson, Reno, Studebaker.
 41150...Henry Rovelli, Reno, Reo.
 41151...Don Partipilo, Reno, Chevrolet.
 41152...Wm. Schmidt, Sparks, Chevrolet.
 41153...Dave Erickson, Reno, Chevrolet.
 41154...Herman Rutler, Sparks, Studebaker.
 41155...James Passeno, Las Vegas, Dodge.
 41156...John W. Wedge, Alamo, Ford.
 41157...Lewis G. Gill, Pioche, Buick.
 41158...G. Edgar Nesbitt, Hiko, Ford.
 41159...A. J. McQuistion, Montello, Ford.
 41160...Wes. Johnson Co., Montello, Ford.
 41161...Wes. Johnson Co., Montello, Buick.
 41162...Tom Harney, Pioche, Ford.
 41163...Chas Ruden, Eureka, Ford.
 41164...A. J. Snyder, Eureka, Ford.
 41165...C. R. Prangley, Reno, Ford.
 41166...Jas. P. Byrnes, Fernley, Buick.
 41167...Mrs. L. G. Wedekind, Fernley, Ford.
 41168...Peoples Bros., Fernley, Dort.
 41169...Andres Anderson, Fernley, Ford.
 41170...D. H. Downs, Sparks, Ford.
 41171...Miles E. North, Reno, Oldsmobile.
 41172...George A. Steele, Fernley, Chevrolet.
 41173...Magus Carlson, Fallon, Ford.
 41174...Paulson Bros., Fallon, Ford.
 41175...Con. Groene, Fallon, Dort.
 41177...Ferguson & Allen, Fallon, Chevrolet.
 41178...Clyde H. Smith, Fallon, Ford.
 41179...Antonio Gomey, Fallon, Seen.
 41180...J. E. Peterson, Reno, Ford.
 41181...Ernest Schroeder, Sparks, Overland.
 41182...Henrietta E. Heany, Sparks, Studebkr.
 41183...J. H. Wheat, Sparks, Oakland 8.
 41184...W. S. Macpherson, Sparks, Ford.
 41185...W. S. Macpherson, Sparks, Hupmobile.
 41186...Mrs. Mary Austin, Sparks, Overland.
 41187...Francis C. Moore, Tonopah, Hudson.
 41188...C. M. Way, Fallon, Buick.
 41189...Sam Wingfield, Fallon, Ford.
 41190...W. S. Short, Arthur, Dodge.
 41191...James Scranton, Deeth, Dodge.
 41192...D. N. Elder, Derby, Ford.
 41193...C. J. Gault, Reno, Chevrolet.
 41194...H. W. Underhill, Caliente, Ford.

- 41195...Phillip Perazzo, Reno, Maxwell.
 41196...B. R. Russell, Sheridan, Ford.
 41197...B. L. Park, Sheridan, Buick.
 41198...Vern Park, Sheridan, Overland.
 41199...E. A. Dyer, Wabuska, Buick.
 41200...Holcomb Bros., Reno, Buick.
 41201...Yparraguirre Sisters, Reno, Dodge.
 41202...J. & R. Ferretto, Steamboat, Ford.
 41203...Carly Kateme, Yerington, Studebaker.
 41204...Frank W. Brooks, Yerington, Ford.
 41205...Frank J. Bart, Reno, Buick.
 41206...James Atchison, Reno, Buick.
 41207...Holcomb Bros., Reno, Ford.
 41208...Donald W. Everett, Minden, Ford.
 41209...Louis Auranze, Minden, Ford.
 41210...A. C. Trieloff, Simpson, Buick.
 41211...A. C. Trieloff, Simpson, Chevrolet.
 41212...Dick Winkelman, Genoa, Ford.
 41213...Henry Winkelman, Genoa, Dodge.
 41214...Herman Winkelman, Minden, Buick.
 41215...G. M. Terry, Wellington, Chandler.
 41216...Joe Schneider, Carson City, Ford.
 41217...Joe Schneider, Carson City, Reo.
 41218...Douglas School Dist., Carson, Ford.
 41219...Hunewill L. & L. Co., Wellington, Buick.
 41220...John Ross, Yerington, Oakland.
 41221...Maionchi Bros., Yerington, Ford.
 41222...Clarence A. Menke, Reno, Ford.
 41223...Maionchi Bros., Yerington, Buick.
 41224...Herman L. Schreck, Round Mtn., Ford.
 41225...Associated Oil Co., Reno, Republic.
 41226...Horton Howes, Wadsworth, Ford.
 41227...Al Brundige, Reno, Oakland.
 41228...J. Bradshaw, Reno, Ford.
 41229...L. L. Dellinger, Goldfield, Roamer.
 41230...Ben Gill, Goldfield, Buick.
 41231...Goldfield G. B. M. Co., Goldfield, Dodge.
 41232...J. W. Phillips, Verdi, Ford.
 41233...R. E. Horschman, Reno, Chevrolet.
 41234...Jas. N. Hollinger, Pioche, Ford.
 41235...Petersen & Schwarz, Reno, Ford.
 41236...G. W. Cotant, Elko, Studebaker.
 41237...E. Plumb, Reno, Ford.
 41238...Blanche Shuman, Reno, Cadillac.
 41239...L. W. Whiting, Mina, Hupmobile.
 41240...W. L. Dykes, Fallon, Ford.
 41241...Hyatt Bros., Fallon, Ford.
 41242...Percy Hibbard, Fallon, Chevrolet.
 41243...A. N. Therian, Fallon, Chevrolet.
 41244...A. E. Grinnell, Fallon, Chevrolet.
 41245...C. E. McCafferty, Fallon, Ford.
 41246...C. E. Maxwell, Fallon, Maxwell.
 41247...Nels J. Nelson, Fallon, Ford.
 41248...R. L. Combs, Fallon, Ford.
 41249...A. W. Smith, Arthur, Hudson Super 6.
 41250...Newman Supply Co., Elko, Monroe.
 41251...Mrs. Wm. Kennedy, Verdi, Buick.
 41252...P. H. Anderson, Lovelock, Ford.
 41253...Jas. Kjeldsen, Lovelock, Ford.
 41254...W. H. Ketsdever, Reno, Franklin.
 41255...D. M. York, Lovelock, Maxwell.
 41256...T. J. Howard, Lovelock, Ford.
 41257...Andrew Jacobsen, Lovelock, Buick.
 41258...Emil Stank, Lovelock, Oakland.
 41259...Manuel A. Mariara, Lovelock, Oakland.
 41260...Fernley Transfer Co., Fernley, Ford.
 41261...Joseph Hammond, Ursine, Ford.
 41262...C. A. Womack, Montello, Studebaker.
 41263...Roy Hoppie, Montello, Ford.
 41264...Fred Hoppie, Montello, Ford.
 41265...Sam Imelli, Franktown, Overland.
 41266...John Lamb, Goodsprings, Ford.
 41267...H. A. Paradis, Montello, Studebaker.
 41268...John Quick, Nelson, Dodge.
 41269...Stillman Vaughan, Ruby Valley, Dodge.
 41270...H. M. Hilborn, Reno, Oldsmobile.
 41271...Dr. J. W. Davis, Hawthorne, Briscoe.
 41272...F. Mancini, Yerington, Ford.
 41273...Roy McGowan, Yerington, Buick.
 41274...John M. Block, Reno, Overland.
 41275...Dr. G. F. Rue diger, Reno, Dodge.
 41276...Iver E. Johnson, Reno, Ford.
 41277...N. Block, Reno, Ford.
 41278...F. D. Hagar, Reno, Ford.
 41279...J. E. Troei, Sparks, Ford.
 41280...Pete Olsen, Reno, Ford.
 41281...J. T. Richheart, Fallon, Ford.
 41282...Fred A. Nelson, Fallon, Ford.
 41283...G. W. Robinson, Sparks, Buick.
 41284...R. L. Robinson, Sparks, Buick.
 41285...H. W. Doan, Tonopah, Overland.
 41286...E. W. Griffith, Las Vegas, Stevens-Dur.
 41287...Mike Millett, Round Mtn., Ford.
 41288...W. O. Baker, Sr., McDermitt, Ford.
 41289...Lewis Parks, Las Vegas, Maxwell.
 41290...Paul Stoeck, Luning, Dodge.
 41291...L. P. Nelson, Mina, Reo.
 41292...A. E. Johnson, Mina, Ford.
 41293...L. L. Muahett, Tonopah, Oldsmobile.
 41294...John L. Dynan, Tonopah, Overland.
 41295...A. Fellenbum, Mina, Scripps-Booth.
 41296...Mrs. Dora Woodsen, Reno, Oldsmobile.
 41297...J. Y. Anderson, Mina, Ford.
 41298...Pacific M. & F. Co., Lovelock, Duplex.
 41299...Pacific M. & F. Co., Lovelock, Duplex.
 41300...Pacific M. & F. Co., Lovelock, FWD.
 41301...A. B. Blundell, Sparks, Hudson.
 41302...Mrs. G. W. Steiner, Sparks, Chevrolet.
 41303...Wm. Steiner, Sparks, Ford.
 41304...S. F. Whitney, Pioche, Ford.
 41305...Wm. States, Reno, Ford.
 41306...Hotel Golden, Reno, Federal.
 41307...Jas. Hanson, Reno, Ford.
 41308...John G. Gault, Reno, Dodge.
 41309...M. Morrison, Fallon, Dort.
 41310...Fred Waidely, Fallon, Ford.
 41311...Fred Waidely, Fallon, Ford.
 41312...Silver King D. M. Co., Tonopah, Ford.
 41313...L. C. Butterfield, Reno, Ford.
 41314...P. E. Kline, Ludwig, Ford.
 41315...P. H. Wolf, Lovelock, Chalmers.
 41316...Louis Feldman, Fallon, Ford.
 41317...E. J. Cessna, Sparks, Studebaker.
 41318...Nels Erickson, Mina, Ford.
 41319...W. Thompson, Carson City, Oakland.
 41320...C. W. Hyatt, Reno, Franklin.
 41321...H. B. Beers, Minden, Buick.
 41322...Wm. E. Brown, Reno, Hudson.
 41323...Flanigan W. Co., Reno, Garford.
 41324...Edward Kingman, Reno, Overland.
 41325...Anderson Bros., Gardnerville, Kleiber.
 41326...Anderson Bros., Gardnerville, Kleiber.
 41327...H. G. Marsh, Minden, Buick.
 41328...Eugene Scossa, Sheridan, Buick.
 41329...H. Rosenbrock, Gardnerville, Overland.
 41330...Wm. Wenholdt, Minden, Buick.
 41331...Alex M. Dickson, Simpson, Chevrolet.
 41332...J. E. Hollingsworth, Reno, Ford.
 41333...C. E. Clough, Reno, Mitchell.
 41334...R. N. Gibson, Ludwig, Ford.
 41335...Mrs. M. M. Harms, Reno, Chevrolet.
 41336...W. E. Twist, Fernley, Chevrolet.
 41337...G. W. Bonney, Fernley, Reo.
 41338...Jesse Damron, Caliente, Ford.
 41339...W. E. Brodie, Pioche, Ford.
 41340...Prince Con. M. Co., Pioche, Dodge.
 41341...F. E. Smith, Montello, Studebaker.
 41342...Scott Griswald, Lee, Oldsmobile.
 41343...E. A. Clawson, Elko, Ford.
 41344...A. L. McGinty, Elko, Oldsmobile.
 41345...A. L. McGinty, Elko, Ford.
 41346...D. W. Frank, Elko, Ford.
 41347...Sidney Myer, Reno, Willys-Knight.
 41348...Frank Bros. Co., Reno, Ford.
 41349...Dr. C. E. Rhodes, Reno, Overland.
 41350...Wm. Woodburn, Reno, Reo.
 41351...Hans Christensen, Lovelock, Ford.
 41352...Clio Lumber Co., Reno, Reo.
 41353...P. S. Parker, Las Vegas, Ford.
 41354...H. O. Shoutz, Sparks, Oldsmobile.
 41355...James Larson, Sparks, Maxwell.
 41356...W. M. Clark, Reno, Ford.
 41357...Geo. Jensen, Sparks, Ford.
 41358...V. Whitlock, Sparks, Hupmobile.
 41359...A. E. Crossitt, Sparks, Oakland.
 41360...W. H. Austin, Fernley, Chevrolet.
 41361...Alice R. Austin, Fernley, Ford.
 41362...W. H. Austin, Fernley, Ford.
 41363...Rodgers Ranch, Lovelock, Ford.
 41364...Rodgers Ranch, Lovelock, Ford.
 41365...Geo. Jeffery, Fernley, Hudson.
 41366...F. P. Quinn, Reno, Buick.
 41367...M. D. Fairchild, Reno, Oldsmobile.
 41368...W. L. Samuels, Reno, Oldsmobile.

- 41369...R. J. Scott, Reno, Reo.
 41370...Standard Oil Co., Reno, Studebaker.
 41371...Standard Oil Co., Reno, Cadillac.
 41372...Standard Oil Co., Reno, Ford.
 41373...Standard Oil Co., Reno, Buick.
 41374...Standard Oil Co., Reno, Ford.
 41375...Standard Oil Co., Reno, Ford.
 41376...Standard Oil Co., Battle Mtn., Ford.
 41377...Standard Oil Co., Yerington, Ford.
 41378...Standard Oil Co., Fallon, Ford.
 41379...Standard Oil Co., Tonopah, Ford.
 41380...Standard Oil Co., Winnemucca, Ford.
 41381...Standard Oil Co., Goldfield, Ford.
 41382...Standard Oil Co., Elko, Ford.
 41383...Standard Oil Co., Carson City, Ford.
 41384...Standard Oil Co., Lovelock, Ford.
 41385...Standard Oil Co., East Ely, Dodge.
 41386...Standard Oil Co., Reno, Garford.
 41387...Standard Oil Co., East Ely, Packard.
 41388...Standard Oil Co., Tonopah, White.
 41389...Standard Oil Co., Tonopah, White.
 41390...Standard Oil Co., East Ely, Republic.
 41391...Standard Oil Co., Carson City, Ford.
 41392...Standard Oil Co., Reno, Autocar.
 41393...Standard Oil Co., Yerington, Ford.
 41394...Standard Oil Co., Lovelock, Maxwell.
 41395...Standard Oil Co., Fallon, Maxwell.
 41396...Standard Oil Co., Fallon, Mack.
 41397...Standard Oil Co., Carson City, Mack.
 41398...Standard Oil Co., Lovelock, Mack.
 41399...Standard Oil Co., Reno, Mack.
 41400...Standard Oil Co., Yerington, Mack.
 41401...Jesse Christensen, Fernley, Ford.
 41402...B. L. Konkle, Sparks, Dodge.
 41403...Devlin Bros., Pioche, Ford.
 41404...Irish Mtn. Silver Mines, Caliente, Ford.
 41405...Nevada Transfer Co., Reno, Republic.
 41406...Nevada Transfer Co., Reno, GMC.
 41407...Nevada Transfer Co., Reno, Reo.
 41408...Nevada Transfer Co., Reno, Studebaker.
 41409...Nevada Transfer Co., Reno, Buick.
 41410...Nevada Transfer Co., Reno, Republic.
 41411...Nevada Transfer Co., Reno, L. Giant.
 41412...Reno P. L. & W. Co., Reno, Buick.
 41413...Reno P. L. & W. Co., Reno, Cadillac.
 41414...Walter Norris, Reno, Haynes.
 41415...Reno P. L. & W. Co., Reno, Buick.
 41416...Reno P. L. & W. Co., Reno, Buick.
 41417...Reno P. L. & W. Co., Reno, Buick.
 41418...Reno P. L. & W. Co., Reno, Dodge.
 41419...Reno P. L. & W. Co., Reno, Dodge.
 41420...Reno P. L. & W. Co., Reno, Ford.
 41421...Reno P. L. & W. Co., Reno, Ford.
 41422...Reno P. L. & W. Co., Reno, Ford.
 41423...Reno P. L. & W. Co., Reno, Ford.
 41424...Reno P. L. & W. Co., Reno, Cartercar.
 41425...Art. Caughlin, Reno, Buick.
 41426...Peter Williams, Carson City, Ford.
 41427...Standard Oil Co., Battle Mtn., Republic.
 41428...L. W. Crehore, Fallon, Overland.
 41429...W. B. Cooper (lost in transit; see No. 44263).
 41430...Thos. W. Byer, Fallon, Chevrolet.
 41431...John D. Blush, Bonnie Claire, Ford.
 41432...Albert Brown, Mina, Ford.
 41433...Mason Valley M. Co., Thompson, Cad.
 41434...Mason Valley M. Co., Thompson, P. Ar.
 41435...E. A. Byler, Goldfield, Overland.
 41436...W. E. Smith, Caliente, Ford.
 41437...H. L. Gleason, Reno, Ford.
 41438...A. W. Lofthouse, Fallon, Ford.
 41439...Clyde Gumnow, Fallon, Dodge.
 41440...E. B. Loring, Fallon, Oldsmobile.
 41441...Mrs. F. W. Schmalzing, Fallon, Ford.
 41442...Orville Benadum, Fallon, Ford.
 41443...E. D. Frazzini, Fallon, Overland.
 41444...L. E. Weaver, Fallon, Dort.
 41445...Wm. Rutledge, Carlin, Ford.
 41446...C. A. Harris, Battle Mtn., Studebaker.
 41447...L. Munk, Lovelock, Ford.
 41448...Union Land & Cattle Co., Reno, Dodge.
 41449...P. W. Hull, Ely, Dodge.
 41450...R. P. Lamborn, McGill, Dodge.
 41451...Hobart Estate Co., Reno, Maxwell.
 41452...Hobart Estate Co., Reno, Service.
 41453...Thos. Osborne, Tonopah, Buick.
 41454...Geo. Probasco, Tonopah, Ford.
 41455...Charles Kirchen, Tonopah, Reo.
 41456...John G. Kirchen, Tonopah, Hudson 6.
 41457...Geo. A. Sheldon, Tonopah, Ford.
 41458...Virginia Louise M. Co., Pioche, Ford.
 41459...James B. Geddes, Mina, Ford.
 41460...Mrs. Ettie Wade, Wabuska, Ford.
 41461...J. M. Feeney, Wabuska, Ford.
 41462...Antone Tiamagni, Yerington, Hupmo.
 41463...Morris Gomi, Yerington, Ford.
 41464...Economy Laundry Co., Reno, Ford.
 41465...Economy Laundry Co., Reno, Ford.
 41466...Economy Laundry Co., Reno, Chevrolet.
 41467...Economy Laundry Co., Reno, Chevrolet.
 41468...A. R. Tobey, Winnemucca, Hudson.
 41469...C. M. White, Searchlight, Chevrolet.
 41470...Louis Raffetto, Reno, Hupmobile.
 41471...M. M. Cantrell, Tonopah, Buick.
 41472...A. L. & Hazel Shaw, Reno, Chevrolet.
 41473...Techatticup Mine, Nelson, Ford.
 41474...D. H. Bruce, Fernley, Ford.
 41475...J. M. Blood, Reno, Ford.
 41476...R. L. Thompson, Reno, Chandler.
 41477...Hiram Stoker, Lovelock, Ford.
 41478...Washoe County, Reno, Moreland.
 41479...Washoe County, Reno, Oldsmobile.
 41480...Washoe County, Reno, Nash.
 41481...Washoe County, Reno, Nash.
 41482...Washoe County, Reno, Moreland.
 41483...Washoe County, Reno, Kelly.
 41484...Washoe County, Reno, Kelly.
 41485...Washoe County, Reno, Duplex.
 41486...Washoe County, Reno, GMC.
 41487...Washoe County, Reno, Acme.
 41488...Washoe County, Reno, Chevrolet.
 41489...Washoe County, Reno.
 41490...Washoe County, Reno, Cadillac.
 41491...E. L. Zimmer, Franktown, Ford.
 41492...D. A. Snyder, Minden, Dodge.
 41493...Mike Prader, Dayton, Buick.
 41494...A. S. Sale, Franktown, Chevrolet.
 41495...Allied L. & L. Co., Yerington, Ford.
 41496...Allied L. & L. Co., Yerington, Dorris.
 41497...Pete Etchecaparr, Gerlach, Haynes.
 41498...Dominique Laxalt, Yerington, Cadillac.
 41499...Allied L. & L. Co., Yerington, Oldsmo.
 41500...Ben Cardinal, Minden, Buick.
 41501...Daniel E. Morton, Carson, Overland.
 41502...Wheeler Livestock Co., Reno, Peerless.
 41503...R. H. Moore, Fallon, Chevrolet.
 41504...Dr. F. A. Harden, Fallon, Dort.
 41505...Bob Griffith, Reno, Ford.
 41506...Wm. S. Bennett, Ludwig, Dodge.
 41507...Geo. Plummer, Yerington, Chevrolet.
 41508...M. Costa, Reno, Ford.
 41509...Frank Berger, Reno, Ford.
 41510...H. C. Madsen, Reno, Dodge.
 41511...Mrs. Blanche Preston, Reno, Dodge.
 41512...Hugh MacKinnon, Caliente, Ford.
 41513...George M. Senter, Caliente, Ford.
 41514...A. T. Donnels, Reno, Pope Hartford.
 41515...Theo. J. Steinmetz, Reno, Buick.
 41516...C. P. Ball, Las Vegas, Cadillac.
 41517...W. Keyser, Carson City, Cadillac.
 41518...W. H. James, Carson City, Chevrolet.
 41519...George Milner, Mason, Oldsmobile.
 41520...Emil Holmstrom, Lovelock, Chalmers.
 41521...A. P. Lauritzen, Copper Basin, Ford.
 41522...A. E. & A. F. Lasher, Reno, Studebkr.
 41523...John Granata, Reno, Buick.
 41524...J. Less Denton, Caliente, Ford.
 41525...W. S. Yates, Palisade, Franklin.
 41526...Jasper Vail, Battle Mtn., Ford.
 41527...Rockwell Bros., Las Vegas, Ford.
 41528...P. Chifolia, Reno, Pilot.
 41529...R. J. Weiden, Reno, Buick.
 41530...W. J. P. Lawton, Reno, Studebaker.
 41531...Robt. Nelson, Reno, Studebaker.
 41532...J. J. Martin, Wellington, Ford.
 41533...H. H. Brower, Reno, Dodge.
 41534...Sam Coromella, Reno, Dodge.
 41535...Mrs. F. E. French, Reno, Dodge.
 41536...Mrs. Bessie Rawson, Yerington, Dodge.
 41537...W. H. Goodin, Lovelock, Reo.
 41538...H. M. Parish, Reno, Chevrolet.

- 41539...S. Capurro & Co., Reno, Reo.
 41540...Tom W. Bissett, Reno, Chevrolet.
 41541...Isaac R. Mathews, Reno, Dodge.
 41542...Sam Inamochi, Fallon, Chevrolet.
 41543...W. E. Smith, Tecoma, Oldsmobile.
 41544...W. Frasee, Reno, Ford.
 41545...Yerington Merc. Co., Yerington, Ford.
 41546...Yerington Merc. Co., Yerington, Rep.
 41547...Dan Bagneschi, Yerington, Ford.
 41548...Chas. O. Gasho, Reno, Hupmobile.
 41549...L. Gentry, Reno, Ford.
 41550...W. D. Robohm, Silver City, Dodge.
 41551...Phillip Custy, Reno, Reo.
 41552...Fred Newton, Tonopah, Ford.
 41553...J. M. Combella, Tonopah, Buick.
 41554...John M. Donnelly, Tonopah, Ford.
 41555...Martin F. Kelly, Tonopah, Dodge.
 41556...L. Gardella, Verdi, Overland.
 41557...Frank Besso, Reno, Ford.
 41558...C. A. Faretto, Reno, Chevrolet.
 41559...L. A. Savage, Lovelock, Cole 8.
 41560...W. F. Kaiser, Fallon, Oldsmobile.
 41561...Thos. B. Coe, Fallon, Reo.
 41562...Gus. Holmby, Reno, Ford.
 41563...J. H. Bible, Fallon, Studebaker.
 41564...J. H. Bible, Fallon, Ford.
 41565...Chas. E. Coe, Fallon, Ford.
 41566...L. A. Styles, Fallon, Ford.
 41567...A. E. Luke, Fallon, Ford.
 41568...C. A. Carmiencke, Fallon, Buick.
 41569...Cole L. Harwood, Reno, Winton.
 41570...K. H. Shaaf, Fallon, Chevrolet.
 41571...Samoville & Flag, Reno, Reo.
 41572...Thos. Lindsay, Tonopah, Chevrolet.
 41573...Smuggler, Aladdin & Harmil Divide M. Companies, Tonopah, Dodge.
 41574...W. S. Carter, Millett, Dodge.
 41575...Chas. H. Reinken, Lamolite, Dodge.
 41576...C. H. Reinken, Lamolite, Dodge.
 41577...Joe Kambeck, Fallon, Ford.
 41578...George Mizui, Fallon, Ford.
 41579...Mrs. T. H. Harper, Sparks, Buick.
 41580...Wm. R. Adams, Sparks, Studebaker.
 41581...Chas. N. Castles, Hiko, Ford.
 41582...Mrs. W. G. Ducker, Reno, Hudson.
 41583...A. E. Bettles, Jr., Tonopah, Hupmobile.
 41584...Egbert Pollard, Tonopah, Ford.
 41585...W. A. Marsh, Tonopah, Oakland.
 41586...W. A. Marsh, Tonopah, Ford.
 41587...S. B. Pray, Reno, Dodge.
 41588...G. Ravera, Reno, Ford.
 41589...Victor F. Christensen, Reno, Ford.
 41590...James Leon Barber, Reno, Ford.
 41591...R. R. Ferrel, Reno, Ford.
 41592...Union Mill & Lbr. Co., Reno, Ford.
 41593...Miss Frances Frey, Reno, Oakland.
 41594...Wayne H. Smith, Derby, Chevrolet.
 41595...L. R. Bassman, Lovelock, Reo.
 41596...Jose C. Ugarriza, McDermitt, Cadillac.
 41597...H. A. Goodwin, Las Vegas, Metz.
 41598...F. H. Bird, Elko, Hudson.
 41599...Lothrop Davis Co., Tonopah, Dodge.
 41600...Tindere Perasso, Reno, Oldsmobile.
 41601...N. P. Neilson, Wabuska, Ford.
 41602...J. O. Parker, Wabuska, Oldsmobile.
 41603...James O'Grady, Las Vegas, Overland.
 41604...J. J. Welch, Reno, Ford.
 41605...M. Quillie, Dayton, Ford.
 41606...George Mizui, Fallon, Chevrolet.
 41607...Knox Johnson, Gardnerville, Dodge.
 41608...R. E. Barrington, Stewart, Chevrolet.
 41609...E. W. Carman, Gardnerville, Ford.
 41610...O. T. Van Sickle, Gardnerville, Ford.
 41611...Wm. Schacht, Minden, Dodge.
 41612...Fritz Schacht, Minden, Chevrolet.
 41613...C. H. Springmeyer, Minden, Reo.
 41614...L. M. Jacobsen, Gardnerville, Dodge.
 41615...Halvor Jacobsen, Gardnerville, Dodge.
 41616...M. Jacobsen, Gardnerville, Dodge.
 41617...Chas. Anderson, Gardnerville, Overland.
 41618...J. E. Currie, Gardnerville, Buick.
 41619...C. L. Hargrave, Gardnerville, Chevrolet.
 41620...Hans Jessens, Simpson, Ford.
 41621...Truckee Meadows Sl. Co., Reno, Olds.
 41622...John Agnes, Reno, Dodge.
 41623...Mrs. F. Fettle, Genoa, Ford.
 41624...G. B. Colombo, Reno, Oldsmobile.
 41625...John F. Wilson, Reno, Hudson 6.
 41626...John Lundergreen, Minden, Buick.
 41627...E. B. Powell, Reno, Reo.
 41628...H. G. Hunkin, Verdi, Ford.
 41629...Joe Bronn, Reno, Ford.
 41630...Jno. C. Duryea, Battle Mtn., Reo.
 41631...Sophy Clink, Reno, Dodge.
 41632...W. E. Lampson, Reno, Ford.
 41633...W. E. Lampson, Reno, Home-made.
 41634...J. S. Gaston, Reno, Ford.
 41635...N. D. Steuart, Goodsprings, Ford.
 41636...Daisy R. Oddie, Reno, Cadillac.
 41637...Geo. G. Miller, Fallon, Ford.
 41638...Mrs. Della Munn, Fallon, Buick.
 41639...P. C. Knox, Fallon, Hupmobile.
 41640...Parrish Bros., Fallon, Ford.
 41641...Earl Tannhill, Wonder, Buick.
 41642...Ed. Berg, Lovelock, Chalmers.
 41643...Theodore Miller, Paradise, Ford.
 41644...S. D. Riley, Paradise, Ford.
 41645...Claude Reeves, Paradise, Ford.
 41646...John C. Foster, Lovelock, Chevrolet.
 41647...John C. Foster, Lovelock, Ford.
 41648...G. M. Gray, Reno, Studebaker.
 41649...F. J. Winzell, Alpha, Ford.
 41650...H. A. Mathis, Battle Mtn., Ford.
 41651...Percy Ryals, Battle Mtn., Ford.
 41652...Carl Jensen, Lovelock, Oakland.
 41653...L. A. Munk, Lovelock, Studebaker.
 41654...Frank Green, Lovelock, Ford.
 41655...J. W. Kromer, Lovelock, Chevrolet.
 41656...J. Dellamadalena, Fernley, Buick.
 41657...F. C. Shaffer, Fallon, Ford.
 41658...T. H. Blundell, Wadsworth, Ford.
 41659...Geo. L. Meacham, Goodsprings, Ford.
 41660...A. Munzebrook, Goodsprings, Ford.
 41661...Dan McDonald, Las Vegas, Ford.
 41662...M. D. Collins, Reno, Ford.
 41663...Lionti Accari, Yerington, Ford.
 41664...F. W. Henderson, Yerington, Oldsmobile.
 41665...A. T. Caselton, Fallon, Chandler.
 41666...A. G. Willard, Fallon, Maxwell.
 41667...Austin & Jarvis, Fallon, Ford.
 41668...Joe Jarvis, Fallon, Dodge.
 41669...Tony Faretto, Reno, Chevrolet.
 41670...O. R. McGinty, Reno, Hupmobile.
 41671...Maxwell Adams, Reno, Studebaker.
 41672...M. F. Goodwin, Reno, Chevrolet.
 41673...Conrad Brothers, Reno, Chevrolet.
 41674...Walter S. Palmer, Reno, Studebaker.
 41675...B. Capurro, Reno, Hudson.
 41676...B. Capurro, Reno, Ford.
 41677...George Alton, Reno, Hudson.
 41678...H. A. Fordyce, Reno, Dodge.
 41679...Troy Laundry, Reno, Ford.
 41680...Troy Laundry, Reno, Ford.
 41681...Troy Laundry, Reno, Ford.
 41682...C. M. White, Reno, Ford.
 41683...Troy Laundry, Reno, Cadillac.
 41684...C. B. Nance, Ruth, Hudson.
 41685...Mrs. W. T. Kelly, Reno, Studebaker 6.
 41686...Guss Lawrant, Austin, Buick.
 41687...Henry Lebeau, Ione, Ford.
 41688...F. F. Jenken, Austin, Ford.
 41689...Amnden Bros., Pioche, Ford.
 41690...Lester Lytle, Uraine, Ford.
 41691...United C. & P. Co., Goldfield, Liberty.
 41692...United C. & P. Co., Goldfield, Republic.
 41693...United C. & P. Co., Goldfield, Ford.
 41694...United C. & P. Co., Goldfield, Ford.
 41695...W. D. Claire, Goldfield, International.
 41696...W. D. Claire, Goldfield, Jordan.
 41697...Harold Speicker, Las Vegas, Ford.
 41698...John Nay, Tonopah, Ford.
 41699...John Nay, Tonopah, Ford.
 41700...Chester Carpenter, Tonopah, Buick.
 41701...Steve T. Aguirre, Las Vegas, Studebaker.
 41702...V. E. Greenwald, Tonopah, Ford.
 41703...B. J. Byrne, Tonopah, Overland.
 41704...Tonopah Ext. M. Co., Tonopah, Fed.
 41705...Tonopah Ext. M. Co., Tonopah, Fed.
 41706...P. P. Hedges, Tonopah, Ford.
 41707...A. W. Crittenden, Tonopah, Ford.
 41708...M. Mongrandi, Tonopah, Dodge.
 41709...Wm. Cochran, Tonopah, Oakland.
 41710...J. A. French, Tonopah, Dodge.

- 41711.....Madison E. Locke, Keystone, Ford.
 41712.....Madison E. Locke, Keystone, Ford.
 41713.....J. A. Moore, Round Mtn., Studebaker.
 41714.....C. L. Fish, Round Mtn., Ford.
 41715.....Toggerly Divide M. Co., Tonopah, Ford.
 41716.....Toggerly Divide M. Co., Tonopah, Ford.
 41717.....D. Pazzi, Reno, Oakland.
 41718.....Domanick Chicago, Sparks, Oakland.
 41719.....Dean Hays Carr, Carrara, Maxwell.
 41720.....E. W. Cragin, Las Vegas, Ford.
 41721.....E. E. Smith, Las Vegas, Hupmobile.
 41722.....Boggs Bros., Las Vegas, Ford.
 41723.....Boggs Bros., Las Vegas, Ford.
 41724.....O. C. Boggs, Las Vegas, Stutz.
 41725.....Arthur C. Thompson, Fallon, Dort.
 41726.....D. J. Kinney, Fallon, Hollier.
 41727.....R. S. Peterson, Reno, Ford.
 41728.....J. H. Smith, Reno, Ford.
 41729.....Louis Capurro, Reno, Ford.
 41730.....W. A. Larson, Fallon, Ford.
 41731.....Geo. S. Green, Reno, Cadillac.
 41732.....B. R. Jefferson, Las Vegas, Ford.
 41733.....J. P. Anderson, Overton, Dodge.
 41734.....Mesquite Grocery, Las Vegas, Ford.
 41735.....Leonidas Swain, Schurz, Ford.
 41736.....W. H. Johns, Yerington, Dodge.
 41737.....Joseph Johns, Yerington, Ford.
 41738.....Jims Divide M. Co., Tonopah, Ford.
 41739.....Polo Divide L. Co., Tonopah, Ford.
 41740.....Antelope L. & C. Co., Yerington, Dodge.
 41741.....Antelope L. & C. Co., Yerington, Ford.
 41742.....G. E. Leavitt, Yerington, Dodge.
 41743.....Dept. of Agriculture, Tonopah, Packard.
 41744.....Dept. of Agriculture, Tonopah, Ford.
 41745.....J. O. McKernan, Ely, Ford.
 41746.....H. F. Golding, Reno, Willys-Overland.
 41747.....Mrs. N. E. Nielson, Reno, Chevrolet.
 41748.....C. Elges, Reno, Ford.
 41749.....S. G. Palmer, Reno, Oakland.
 41750.....H. C. Clapp, Carson City, Cadillac.
 41751.....J. C. Jones, Reno, Overland.
 41752.....H. Cooper, Reno, Dort.
 41753.....C. E. Gould, Reno, Dodge.
 41754.....Frank Feldman, Winnemucca, Studeb.
 41755.....Miguel Cobiaga, Winnemucca, Olds.
 41756.....Andrew Thomsen, Winnemucca, Intl.
 41757.....A. E. Sykes, Winnemucca, Ford.
 41758.....R. Barry, Golconda, Ford.
 41759.....Ben B. Inamasa, Winnemucca, Ford.
 41760.....Carl Stoffelt, Winnemucca, Reo.
 41761.....A. Parker, Nelson, Ford.
 41762.....W. W. Elkins, Reno, Ford.
 41763.....Harry H. Turrittin, Reno, Chevrolet.
 41764.....Arthur J. Harris, Vya, Ford.
 41765.....Munro S. Brown, Las Vegas, Buick.
 41766.....T. W. Mollart, Yerington, Ford.
 41767.....H. R. Amens, East Ely, Dodge.
 41768.....J. Manz, Fallon, Buick.
 41769.....Frank Viera, Stillwater, Oakland.
 41770.....C. M. Powell, Fallon, Ford.
 41771.....Max Pannier, Lovelock, Ford.
 41772.....H. E. Ordway, Derby, Ford.
 41773.....G. G. Gault, Fallon, Ford.
 41774.....W. F. Shaw, Fallon, Ford.
 41775.....R. A. Nuckols, Cherry Creek, Ford.
 41776.....W. A. Ring, Contact, Chevrolet.
 41777.....Nevada State Prison, Carson, Ford.
 41778.....Nevada State Prison, Carson, Locomob.
 41779.....Nevada State Prison, Carson, Cadillac.
 41780.....John Allard, Reno, Ford.
 41781.....U. S. Hanson, Steamboat, Chevrolet.
 41782.....A. C. Nielsen, Steamboat, Chevrolet.
 41783.....Wm. Newell, Wellington, Buick.
 41784.....Myrta A. Galle, Minden, Overland.
 41785.....Henry Robbins, Goodsprings, White.
 41786.....S. Imelli, Carson City, Dodge.
 41787.....Mrs. Tosca Slater, Carson City, Olds.
 41788.....Dan Muldoon, Carson City, Overland.
 41789.....Mason Lumber & Coal Co., Mason, Ford.
 41790.....I. S. Dickson, Mason, Hupmobile.
 41791.....Dave Gurr, Mason, Buick.
 41792.....C. B. Logan, Yerington, Grant 6.
 41793.....Ernest Ashlimann, Yerington, Maxwell.
 41794.....Harry S. Maxwell, Yerington, Ford.
 41795.....C. Erickson & Co., Yerington, Ford.
 41796.....G. Scatena, Yerington, Studebaker.
 41797.....George Krema, Mason, Overland.
 41798.....Joe Aznarez, Wellington, Chevrolet.
 41799.....R. A. McClelland, Ludwig, Ford.
 41800.....James W. Gaughan, Yerington, Ford.
 41801.....Romeo Rasaschi, Yerington, Ford.
 41802.....John Thomson, Gardnerville, Overland.
 41803.....Lee Wilkerson, Smith, Ford.
 41804.....Morton J. Gray, Gardnerville, Ford.
 41805.....Frank Pocetti, Reno, Dodge.
 41806.....A. G. Fletcher, Reno, Buick.
 41807.....Leslie R. McKenzie, Verdi, Ford.
 41808.....N. F. Petersen, Reno, Ford.
 41809.....Hobart Estate Co., Reno, Nash.
 41810.....B. M. Selkirk, Gardnerville, Overland.
 41811.....Robert E. Shaw, Oreana, Briscoe.
 41812.....John Nagel, Yerington, Ford.
 41813.....W. R. Butner, Yerington, Dodge.
 41814.....J. A. Moody, Las Vegas, Ford.
 41815.....A. Scagnetti, Reno, Chevrolet.
 41816.....Wm. S. Park, Las Vegas, Hudson.
 41817.....Chas. E. Week, Reno, Hudson.
 41818.....O. Lammari, Yerington, Ford.
 41819.....Mrs. Paul Fresh, Las Vegas, Dodge.
 41820.....Louis Menki, Yerington, Ford.
 41821.....J. J. Cannon, Las Vegas, Dodge.
 41822.....J. Hepp, Reno, Buick.
 41823.....W. R. McCrea, Reno, Overland.
 41824.....Folsom & Keenan, Tonopah, Ford.
 41825.....East Divide M. Co., Goldfield, Ford.
 41826.....Silver Pick Con. M. Co., Goldfield, Ford.
 41827.....Thos. Geraghty, Ely, Republic.
 41828.....E. L. Peacock, Lund, Ford.
 41829.....L. T. Brock, Ely, Ford.
 41830.....L. G. Cannon, East Ely, Overland.
 41831.....Kolovos & Provas, McGill, Ford.
 41832.....Pete Mariluck, Schellbourne, Dodge.
 41833.....Ross Woodward, Ely, Ford.
 41834.....Harry G. McCulloch, Ely, Dodge.
 41835.....Buster Cleveland, Ely, Ford.
 41836.....H. E. Magruder, Ely, Ford.
 41837.....Hugh Wilson, Ely, Ford.
 41838.....Adams-McGill, Ely, Ford.
 41839.....Adams-McGill, Ely, Ford.
 41840.....Adams-McGill, Ely, Ford.
 41841.....Adams-McGill, Ely, Ford.
 41842.....Adams-McGill, Ely, Ford.
 41843.....Adams-McGill, Ely, Packard.
 41844.....H. S. Deane, Reno, Dodge.
 41845.....Standard Oil Co., Tonopah, Ford.
 41846.....Adams-McGill, Ely, Stanley Steamer.
 41847.....Adams-McGill Co., Ely, Ford.
 41848.....William Gardiner, Yerington, Ford.
 41849.....Mrs. Ollie Crass, Yerington, Oakland.
 41850.....Mrs. Earl S. Cobb, Palisade, Ford.
 41851.....John Desmond, Tonopah, Chevrolet.
 41852.....Sarsen & Pelose, Reno, Ford.
 41853.....Campbell Furniture Co., Reno, Dodge.
 41854.....Mathews & Costello, Yerington, Ford.
 41855.....J. W. Cook, Las Vegas, Ford.
 41856.....C. H. Stoddard, Reno, Chevrolet.
 41857.....Hogan & Muran, Reno, Dodge.
 41858.....A. R. Kramer, Carson City, Buick.
 41859.....L. W. Berrum, Moana, Overland.
 41860.....C. B. Burkham, Hawthorne, GMC.
 41861.....Bert Duke, Minden, Ford.
 41862.....Rev. C. S. Mook, Carson, Chevrolet.
 41863.....Mrs. L. E. Ryan, Carson, Chevrolet.
 41864.....G. E. Wilson, Yerington, Reo.
 41865.....H. C. Dukes, Yerington, Reo.
 41866.....Hallie Rav, Reno, Buick.
 41867.....Mrs. M. G. Cecil, Carson, Oldsmobile.
 41868.....Gold Pen Mines Co., Reno, Buick.
 41869.....J. W. Marley, Reno, Scripps-Booth.
 41870.....Carson Water Co., Carson, Ford.
 41871.....I. Hepp, Reno, Ford.
 41872.....E. O. Splatt, Reno, Ford.
 41873.....Geo. Siri, Reno, Ford.
 41874.....Mrs. Kit Carson, Reno, Ford.
 41875.....H. L. Solano, Reno, Ford.
 41876.....John Nones, Reno, Ford.
 41877.....R. Raymond, Reno, Ford.
 41878.....J. J. Ferretti, Wadsworth, Oldsmobile.
 41879.....E. Barcos, Reno, Buick.
 41880.....L. L. Gilcrease, Reno, Hudson 6.
 41881.....O. D. Dunning, Reno, Overland.
 41882.....N. S. LaPoint, Sparks, Studebaker.
 41883.....J. R. Watson, Sparks, Lexington.
 41884.....F. E. Humphrey, Reno, Reo.

- 41885...Frank Trosi, Reno, Chevrolet.
 41886...N. Ginocchio, Reno, Chevrolet.
 41887...Louis Jensen, Reno, Reo.
 41888...Reno Press Brick Co., Reno, FWD.
 41889...Reno Press Brick Co., Reno, Ford.
 41890...H. L. DeHart, Reno, Overland.
 41891...Daniel Drewitz, Reno, Hupmobile.
 41892...Paul E. Dragon, Reno, Chevrolet.
 41893...J. G. McGowan, Yerington, Reo.
 41894...E. A. Settlemyer, Reno, Dodge.
 41895...Harry Robinson, Rochester, Dort.
 41896...J. G. McGowan, Yerington, Ford.
 41897...Mrs. Joseph Giraud, Reno, Oldsmo.
 41898...G. F. Stock, Fernley, Chevrolet.
 41899...Chas. Keller, Reno, Overland.
 41900...A. Parker Lewis, Reno, Mitchell.
 41901...A. N. Gault, Reno, Ford.
 41902...M. Filippelli, Reno, Hudson.
 41903...Lindley & Co., Reno, Ford.
 41904...Mrs. L. Miltenberger, Reno, Studebkr.
 41905...Sanford C. Dinsmore, Reno, Buick.
 41906...M. Dandero, Hawthorne, Chevrolet.
 41907...Verdi Lumber Co., Oreana, Reo.
 41908...L. Andrus, Battle Mtn., Ford.
 41909...Hill Bros., Goldfield, Goldfield.
 41910...Mrs. Al McCoy, Goldfield, Chandler.
 41911...Ethel Pope, Reno, Ford.
 41912...R. M. Guthrie, Reno, Oakland.
 41913...R. M. Guthrie, Reno, Ford.
 41914...H. J. Gosse, Reno, Locomobile.
 41915...H. J. Gosse, Reno, Pathfinder.
 41916...H. J. Gosse, Reno, Kissel Kar.
 41917...Howe & Robertson, Reno, Franklin.
 41918...Pyramid L. & S. Co., Constantia, Fed.
 41919...Nev.-Cal. L. & L. Co., Constantia, Ford.
 41920...Pyramid L. & S. Co., Constantia, Buick.
 41921...Pyramid L. & S. Co., Constantia, Ford.
 41922...Pyramid L. & S. Co., Constantia, Ford.
 41923...Pyramid L. & S. Co., Constantia, Ford.
 41924...Pyramid L. & S. Co., Constantia, Ford.
 41925...C. A. Womack, Montello, Nash.
 41926...Dean Ranch, Beowawe, Ford.
 41927...Dean Ranch, Beowawe, Ford.
 41928...Mrs. H. P. Beer, Reno, Pilot.
 41929...Riverside Mill Co., Reno, Ford.
 41930...Riverside Mill Co., Reno, Federal.
 41931...Riverside Mill Co., Reno, Dodge.
 41932...William L. Horton, Arden, Ford.
 41933...Frank L. Miller, Goodsprings, Ford.
 41934...Maude H. Howell, Reno, Studebaker.
 41935...Wm. K. Howe, Reno, Studebaker.
 41936...Nevada Valleys P. Co., Lovelock, Buick.
 41937...Nevada Valleys P. Co., Lovelock, Ford.
 41938...Nevada Valleys P. Co., Lovelock, Ford.
 41939...Nevada Valleys P. Co., Lovelock, Ford.
 41940...Nevada Valleys P. Co., Lovelock, Ford.
 41941...M. Juarequi, Reno, Cadillac.
 41942...M. Juarequi, Reno, Cadillac.
 41943...H. W. Furmas, Montello, Studebaker.
 41944...Mrs. Frank Kietzke, Reveille, Ford.
 41945...I. S. Thompson, Tonopah, Dodge.
 41946...Geo. M. Rose, Tonopah, Ford.
 41947...W. B. Welfitt, Reno, Ford.
 41948...Nick Kesti, Tonopah, Buick.
 41949...Richard Persigehl, Tonopah, Buick.
 41950...Mrs. W. P. DeWolf, Tonopah, Olds.
 41951...Adaline P. Horton, Tonopah, Buick.
 41952...Joseph Eason, Fallon, Ford.
 41953...S. P. Gross, Fallon, Ford.
 41954...H. R. Hobbs, Fallon, Ford.
 41955...A. D. Bottom, Fallon, Ford.
 41956...Pete Jauregin, Elko, Chandler.
 41957...Cadet Anxo, Elko, Hudson.
 41958...J. P. Perazzo, Wabuska, Stephens.
 41959...B. A. Nichols, Fallon, Ford.
 41960...Mike Arregui, Elko, Hudson.
 41961...Chas. H. Fredson, Elko, Chevrolet.
 41962...Wm. Schacht, Yerington, Dodge.
 41963...W. L. Brackett, Golconda, Willys 6.
 41964...Gil Prida, Winnemucca, Overland 6.
 41965...F. E. Backus, Golconda, Overland.
 41966...Mrs. M. Amell, Tonopah, Ford.
 41967...C. E. Bugg, Mina, Buick.
 41968...W. J. Neely, Wadsworth, Ford.
 41969...Myra Divide M. Co., Tonopah, Republic.
 41970...Mrs. H. W. Orth, Wadsworth, Ford.
 41971...Wm. E. Orr, Las Vegas, Hupmobile.
 41972...A. L. Haight, Fallon, Chandler.
 41973...Bell Telephone Co., Reno, Ford.
 41974...Bell Telephone Co., Reno, Ford.
 41975...Manuel Champo, Las Vegas, Ford.
 41976...Brewster Adams, Reno, Reo 4.
 41977...C. L. Cox, Reno, Ford.
 41978...T. F. Carney, Smith, Ford.
 41979...H. R. Schwacke, Gardnerville, Buick.
 41980...Chas. A. Frost, Wellington, Ford.
 41981...Chas. A. Frost, Wellington, Ford.
 41982...Joe Loury, Nixon, Ford.
 41983...Frank W. Hammond, Fallon, Chevrolet.
 41984...Williams L. & S. Co., Fallon, Essex.
 41985...R. A. Hardy, Fallon, Hudson.
 41986...E. S. Harriman, Fallon, Ford.
 41987...E. W. Dingee, Fallon, Ford.
 41988...F. C. Erb, Fallon, Ford.
 41989...T. F. Frazier, Fallon, Maxwell.
 41990...D. E. Williams, Fallon, Hupmobile.
 41991...E. M. Smith, Fallon, Ford.
 41992...F. A. Glebant, Pioche, Ford.
 41993...O. T. Hoover, Searchlight, Ford.
 41994...F. L. Peterson, Pyramid, Ford.
 41995...Fred Wade, Wabuska, Ford.
 41996...Ambrose Rosaschi, Yerington, Ford.
 41997...Ambrose Rosaschi, Yerington, Dorris.
 41998...A. D. Munroe, Yerington, Ford.
 41999...Fred Dunn, Yerington, Maxwell.
 42000...D. Welge, Mason, Chevrolet.
 42001...W. R. McCulloch, Lovelock, Buick.
 42002...Pitt Ranch, Lovelock, Ford.
 42003...Henry Gutcheon, Lovelock, Chevrolet.
 42004...Henry Riter, Franktown, Overland.
 42005...Trosi Estate Co., Reno, Ford.
 42006...Mrs. Dora Morton, Reno, Oakland.
 42007...J. E. Horgan, Reno, Ford.
 42008...Commercial Hdw. Co., Reno, Ford.
 42009...H. Mouser, Searchlight, Ford.
 42010...E. L. Dutertre, Golconda, Chevrolet.
 42011...Wheeler Livestock Co., Reno, Ford.
 42012...Ida Lipman, Reno, Dort.
 42013...Benito Gueren, Lamolite, Ford.
 42014...Frank Winchell, Wells, Dodge.
 42015...M. Kittle, Ely, Winton 6.
 42016...John Uhlenda, Ely, Nash.
 42017...C. C. Higgins, Rochester, Ford.
 42018...Emily Damm, Lovelock, Ford.
 42019...John Holmstrom, Lovelock, Ford.
 42020...Daniel Salisbury, Fernley, Ford.
 42021...J. A. Damm, Lovelock, Chevrolet.
 42022...Will Beckley, Las Vegas, Hudson.
 42023...John P. Wright, Hiko, Ford.
 42024...H. Crow, Wells, Hupmobile.
 42025...Wong Moon, Battle Mtn., Ford.
 42026...Nick Ginocchio, Reno, Mitchell.
 42027...James R. Sullivan, Reno, Chalmers.
 42028...J. F. Nash, Verdi, Saxon.
 42029...Verdi Lumber Co., Verdi, Ford.
 42030...Verdi Lumber Co., Verdi, Pope.
 42031...Verdi Lumber Co., Verdi, Hudson.
 42032...P. M. Burns, Reno, Cartecar.
 42033...Joseph Rawson, Jr., Reno, Ford.
 42034...T. P. Snode, Reno, Maxwell.
 42035...June E. Meyers, Ely, Hudson.
 42036...L. M. Christensen, Sparks, Overland.
 42037...A. Pollock, Sparks, Oakland.
 42038...J. F. Vulgamore, Sparks, Ford.
 42039...H. W. Wistner, Sparks, Elgin.
 42040...Holbrook, Merrill & Stetson, Reno, Fkln.
 42041...James L. Campbell, Reno, Ford.
 42042...Jack Bryan, Reno, Dodge.
 42043...A. L. J. Clark, Las Vegas, Ford.
 42044...Victor Pierroz, Goldfield, Ford.
 42045...J. W. Dunfee, Goldfield, Buick.
 42046...John Jordan, Goldfield, Ford.
 42047...Pat. Jordan, Goldfield, Ford.
 42048...Rhodes Salt and Borax Co., Mina, Ford.
 42049...J. W. McGowan, Austin, Ford.
 42050...J. H. Schwebe, Austin, Ford.
 42051...Mrs. Ira M. Southworth, Tonopah, Hup.
 42052...Smithline & Hogsd, Austin, Ford.
 42053...Geo. W. Schmidlein, Austin, Dodge.
 42054...B. F. Rogers, Round Mtn., Hupmobile.
 42055...Jas. H. Forman, Tonopah, Overland.
 42056...Max Herman, McGill, Dodge.
 42057...Harry McNamara, Tonopah, Dodge.
 42058...Harry McNamara, Tonopah, Dodge.

- 42059...Con. Spanish B. M. Co., Tonopah, Dodge.
 42060...J. A. Moore, Round Mtn., Ford.
 42061...Homestake Div. M. Co., Tonopah, Ford.
 42062...W. J. Groh, Tonopah, Ford.
 42063...H. F. Bruce, Tonopah, Oldsmobile.
 42064...Kernick Divide M. Co., Tonopah, Ford.
 42065...Ton. Hasbrouck M. Co., Tonopah, Ford.
 42066...Western Divide M. Co., Tonopah, Ford.
 42067...Mrs. Sievert Nelson, Reno, Ford.
 42068...Harvey Majors, Reno, Ford.
 42069...J. C. Day, Sparks, Ford.
 42070...Paul Klein, Reno, Geo.
 42071...M. A. Dromick, Reno, Chandler.
 42072...Ben Rotholz Cigar Co., Reno, Ford.
 42073...J. J. Murray, Reno, Oldsmobile.
 42074...Wm. Klaus, Reno, Nash.
 42075...Catherine Burns, Reno, Buick.
 42076...H. H. Kennedy, Reno, Hudson.
 42077...A. J. Wright & Co., Reno, Overland.
 42078...A. J. Wright & Co., Reno, Chandler.
 42079...Pete Carletti, Palisade, Ford.
 42080...Emerald W. Co., Candelaria, Ford.
 42081...Mrs. Sarah E. Wheeler, Reno, Oldsmo.
 42082...Coffin & Larcombe, Reno, Ford.
 42083...E. B. Coffin, Reno, Buick.
 42084...G. C. Barton, Carson City, Chevrolet.
 42085...Donnels & Steinmetz, Reno, Geo.
 42086...Vincent P. Gianella, Reno, Dodge.
 42087...J. T. Cudahy, Fallon, Overland.
 42088...A. J. McDermott, Deeth, Ford.
 42089...F. Indart, Reno, Buick.
 42090...C. C. Braun, Dayton, Buick.
 42091...C. C. Braun, Dayton, Buick.
 42092...Graham Sanford, Reno, Cadillac.
 42093...A. Panelli, Dayton, Buick.
 42094...G. Geulani, Dayton, Buick.
 42095...Leo Tegles, Dayton, Lexington.
 42096...D. B. Renear, Carson City, Dodge.
 42097...Dick Stoner, Death Valley Junc., Ford.
 42098...John Michie, Searchlight, Ford.
 42099...E. D. Madalina, Reno, Chalmers.
 42100...Walter Pickrell, Reno, Overland.
 42101...Dr. R. P. Chandler, Reno, Oakland.
 42102...H. A. Bony, Reno, Overland.
 42103...Albert C. Lund, Reno, Ford.
 42104...Dan S. Strait, Reno, Ford.
 42105...John Jepsen, Minden, Ford.
 42106...James Audrain, Minden, Overland.
 42107...R. C. Walker, Gardnerville, Chevrolet.
 42108...L. F. Jacobsen, Gardnerville, Dodge.
 42109...A. Settlemyer, Gardnerville, Briscoe.
 42110...A. Settlemyer, Gardnerville, Ford.
 42111...P. E. Rahbeck, Gardnerville, Buick.
 42112...Henry Markquit, Gardnerville, Buick.
 42113...Fred Tholke, Gardnerville, Ford.
 42114...John Feil, Gardnerville, Ford.
 42115...R. L. Warner, Como, Saxon.
 42116...Como Cons. Mines Co., Como, Ford.
 42117...A. Sclarani, Yerington, Oakland.
 42118...Wesley Sexsmith, Virginia, Reno.
 42119...W. D. Park, Minden, Buick.
 42120...W. B. Vickers, Tonopah, Hupmobile.
 42121...Dominik Kovacevic, Tonopah, Ford.
 42122...Mrs. M. G. McGregor, Tonopah, Dodge.
 42123...E. H. Hursh, Fallon, Cunningham.
 42124...C. G. Sellman, Reno, Overland.
 42125...Union L. & C. Co., Reno, Buick.
 42126...W. J. Douglass, Tonopah, Chevrolet.
 42127...Reno P. L. & W. Co., Reno, Vim.
 42128...Nevada Fire Ins. Co., Reno, Studebkr.
 42129...Robert Carlson, Reno, Chandler.
 42130...Merkley & Young, Jiggs, Chandler.
 42131...Merkley & Young, Jiggs, Dodge.
 42132...Harry Bruce, Elko, Dodge.
 42133...L. B. Carvahlo, Elko, Dodge.
 42134...Mrs. C. J. Woodworth, Delamar, Ford.
 42135...S. L. Woodward, Fallon, Overland.
 42136...Nat. Hurd, Simpson, Ford.
 42137...Hoyt Fox Co. Inc., Elko, Ford.
 42138...G. E. Rice, Fallon, Chevrolet.
 42139...Wm. C. Boman, Parran, Ford.
 42140...C. Maggiolo, Reno, Geo.
 42141...L. A. Murphy, Reno, Geo.
 42142...C. C. Carpenter, Lovelock, Hudson.
 42143...J. A. Crotty, Lovelock, Dodge.
 42144...Alma M. Hunt, Reno, Oldsmobile.
 42145...W. C. Pitt, Lovelock, Buick.
 42146...Sam Spring, Northam, Ford.
 42147...Gardner Ranch Co., Alamo, Dodge.
 42148...Andrew M. Anderson, Lovelock, Ford.
 42149...L. Zunini, Lovelock, Ford.
 42150...C. S. DeArmond, Stillwater, Chevrolet.
 42151...R. J. Lofthouse, Fallon, Ford.
 42152...Frank Oar, Fallon, Overland.
 42153...Fallon S. & S. Co., Fallon, Ford.
 42154...W. A. Dexter, Fallon, Buick.
 42155...Fallon S. & S. Co., Fallon, Ford.
 42156...Beneditti & Salter, Lovelock, Hudson.
 42157...Dr. J. B. Wilson, Lovelock, Davis.
 42158...Will Wilson, Lovelock, Chevrolet.
 42159...A. L. Bachrad, Lovelock, Pilot.
 42160...Vick Sebbas, Lovelock, Geo.
 42161...Thos. Wilson, Lovelock, Reno.
 42162...Geo. Gilbert, Lovelock, Reno.
 42163...H. B. Nautka, Lovelock, Ford.
 42164...Chas. Rast, Lower Rochester, Reno.
 42165...Del Boyd, Lovelock, Ford.
 42166...W. H. Orten, Lovelock, Ford.
 42167...Dr. Heitman, Lovelock, Maxwell.
 42168...Sidney Hill, Lovelock, Ford.
 42169...Dr. E. K. Smith, Lovelock, Liberty.
 42170...Wm. Looz, Lovelock, Reno 6.
 42171...Wm. Looz, Lovelock, Overland.
 42172...Frank Fuss, Lovelock, Reno.
 42173...John Dotta, Lovelock, Reno.
 42174...Phillip Anken, Lovelock, Reno.
 42175...Mrs. W. E. Gorton, Fallon, Ford.
 42176...C. M. Christensen, Reno, Maxwell.
 42177...George Foster, Reno, Ford.
 42178...W. C. Gill, Reno, Willys-Knight.
 42179...United Stage & Taxi Co., Ely, Ford.
 42180...United Stage & Taxi Co., Ely, Chalmers.
 42181...United Stage & Taxi Co., Ely, Buick.
 42182...United Stage & Taxi Co., Ely, Buick.
 42183...U. Uchida, Reno, Ford.
 42184...J. J. Fenley, Tonopah, Ford.
 42185...E. R. Bennett, Tonopah, Buick.
 42186...J. Goldsworthy, Yerington, Scripps-B.
 42187...Fred Minning, Round Mtn., Ford.
 42188...Nev. Copper B. R. R. Co., Mason, Reno.
 42189...Bluestone M. & S. Co., Mason, Reno.
 42190...Bluestone M. & S. Co., Mason, Reno.
 42191...Bluestone M. & S. Co., Mason, Ford.
 42192...F. E. Robinson, Ft. Churchill, Ford.
 42193...J. W. Stewart & Co., Tonopah, Hudson.
 42194...J. W. Stewart & Co., Tonopah, Ford.
 42195...J. W. Stewart & Co., Tonopah, GMC.
 42196...West Tonopah M. Co., Tonopah, Ford.
 42197...E. H. Corbett, Round Mtn., Ford.
 42198...Dr. Geo. C. DeVine, Goldfield, Dodge.
 42199...Neilson Bros., Tonopah, Hupmobile.
 42200...Biester & Kennett, Gardnerville, Ovrld.
 42201...Axtec Divide M. Co., Tonopah, Okind.
 42202...A. E. Kent Co., Golconda, Reno.
 42203...A. E. Kent Co., Golconda, Ford.
 42204...Geo. A. Gomes, Golconda, Cadillac.
 42205...Mrs. Wm. Wagner, Reno, Chevrolet.
 42206...Frank Campbell, Reno, Buick.
 42207...Abbie Louise Day, Reno, Chevrolet.
 42208...Dr. F. H. Phillips, Reno, Overland.
 42209...C. E. Prima, Reno, Ford.
 42210...J. F. Tilton, Reno, Essex.
 42211...W. E. Zoebel, Reno, Hudson.
 42212...A. F. Scanavinio, Reno, Acme.
 42213...A. F. Scanavinio, Reno, Pilot.
 42214...A. F. Scanavinio, Reno, Ford.
 42215...H. Lewers, Reno, Overland.
 42216...Beasie B. Peck, Reno, Reno.
 42217...Peck & Sample Co., Inc., Reno, Stude.
 42218...Standard Oil Co., Reno, Mack.
 42219...Standard Oil Co., Reno, Ford.
 42220...Geo. Grose, Reno, Maxwell.
 42221...Geo. Blundell, Sparks, Ford.
 42222...Wm. Kennett, Carson City, Studebaker.
 42223...George Cafalds, Sparks, Studebaker.
 42224...J. H. Stern, Carson City, Buick.
 42225...John McNamara, Sparks, Dodge.
 42226...David Casazza, Reno, Buick.
 42227...Joe Spina, Reno, Willys-Knight.
 42228...Western Mach. & Eng. Co., Reno, Reno.
 42229...Western Mach. & E. Co., Reno, Dodge.
 42230...Dr. J. E. Pickard, Reno, Buick.
 42231...J. A. Beemer, Schurz, Dodge.
 42232...Mrs. M. B. Morgan, Wonder, Ford.

- 42233....Willis B. Parsons, Wonder, Chevrolet.
 42234....Victor Fitz, Fallon, Ford.
 42235....Albert Seekt, Northam, Dodge.
 42236....E. B. Graham, Goldfield, Ford.
 42237....John Slavens, Goldfield, Ford.
 42238....Geo. W. Mapes, Reno, Hudson.
 42239....Alfred R. Peckham, Reno, Ford.
 42240....Edwin Lytle, Uraine, Dodge.
 42241....Geo. Barnes, Inlay, Ford.
 42242....Edwin Wade, Fallon, Overland.
 42243....C. A. Shewan, Fanning, Overland.
 42244....C. A. Shewan, Fanning, Ford.
 42245....A. Figoni, Sparks, Oakland.
 42246....T. J. Edwards, Carson City, Cadillac.
 42247....O. J. Leet, Dayton, Ford.
 42248....C. K. Mathewson, Fallon, Ford.
 42249....Jos. Berger, Carson City, Dodge.
 42250....Hobart Estate Co., Minden, Service.
 42251....R. W. Thorne, Minden, Buick.
 42252....R. A. Sample, Reno, Dort.
 42253....Maurice Mack, Minden, Hudson.
 42254....Dept. of Highways, Carson, Ford.
 42255....Dept. of Highways, Carson, Ford.
 42256....Dept. of Highways, Carson, Chevrolet.
 42257....Dept. of Highways, Carson, Chevrolet.
 42258....Dept. of Highways, Carson, Ford.
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 42260....Dept. of Highways, Carson, Ford.
 42261....Dept. of Highways, Carson, Ford.
 42262....Dept. of Highways, Carson, Haynes.
 42263....Dept. of Highways, Carson, Studebkr.
 42264....Dept. of Highways, Carson, Studebkr.
 42265....Dept. of Highways, Carson, Studebkr.
 42266....Dept. of Highways, Carson, Ford.
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 42277....Dept. of Highways, Carson, Ford.
 42278....Roy R. Michels, Carson, Chevrolet.
 42279....M. Christiansen, Yerington, Ford.
 42280....Donald R. Fraser, Reno, Ford.
 42281....Mrs. G. R. Fetic, Wabuska, Ford.
 42282....Marvin Sorensen, Gardnerville, Ford.
 42283....Herman Bartels, Minden, Buick.
 42284....John Etchemendy, Gardnerville, Dodge.
 42285....V. V. Wyatt, Minden, Ford.
 42286....A. Jensen Co., Gardnerville, Ford.
 42287....Olga Christensen, Gardnerville, Dodge.
 42288....C. Neddenriep, Gardnerville, Overland.
 42289....Burke & Elliot, Reno, Ford.
 42290....F. Heise, L. & L. Co., Gardnerville, Cad.
 42291....D. W. Park, Gardnerville, Cadillac.
 42292....Fred Jepsen, Minden, Ford.
 42293....Frank Settelmeyer, Genoa, Ford.
 42294....T. Hansen, Gardnerville, Chevrolet.
 42295....Henry Cordes, Jr., Gardnerville, Dodge.
 42296....C. V. Meat Market, Minden, Buick.
 42297....Geo. Fay, Minden, Buick.
 42298....H. A. Meder, Minden, Oldsmobile.
 42299....H. A. Meder, Minden, International.
 42300....Fred Blester, Gardnerville, Overland.
 42301....Heise L. & L. Co., Gardnerville, Ford.
 42302....Heise L. & L. Co., Gardnerville, Buick.
 42303....J. D. Yeager, Simpson, Ford.
 42304....C. F. Hurd, Simpson, Ford.
 42305....J. B. Bookman, Mason, Overland.
 42306....H. C. Rawlings, Reno, Chandler.
 42307....Newton E. Potter, Reno, Ford.
 42308....J. W. Lewis, Reno, Ford.
 42309....O. S. Kurtz, Reno, Ford.
 42310....G. T. Wilder, Reno, Studebaker.
 42311....Albert Graill, Verdi, Overland.
 42312....R. D. Johns, Sweetwater, Ford.
 42313....Frank P. Langan, Virginia, Reno.
 42314....L. L. Wattles, Eureka, Ford.
 42315....W. E. Arnold, Las Vegas, Studebaker.
 42316....Raymond Oyabide, Battle Mtn., Ford.
 42317....Mercer & Mercer, Goldfield, Hupmo.
 42318....Frank Manson, Reno, Cadillac.
 42319....F. G. Wallender, Sparks, Ford.
 42320....Donnelly L. & L. Co., Gerlach, Ford.
 42321....Donnelly L. & L. Co., Gerlach, Buick.
 42322....Sam E. Lutz, Tonopah, Chevrolet.
 42323....A. H. Keenan, Tonopah, Dodge.
 42324....Mark R. Averill, Tonopah, Dodge.
 42325....Averill & Frisbie, Tonopah, Dodge.
 42326....A. H. Ahlborn, Fallon, Ford.
 42327....J. W. Carson, Fallon, Ford.
 42328....H. B. Wendt, Fallon, Chevrolet.
 42329....Lucy C. Gilpin, Sparks, Buick.
 42330....Mrs. J. R. Swindell, Sparks, Chevrolet.
 42331....Fred L. Potter, Elko, Ford.
 42332....Wheeler Livestock Co., Reno, Buick.
 42333....H. H. McCreery, Carson, Chevrolet.
 42334....Wm. Van Tassel, Sparks, Buick.
 42335....Fred V. Cummins, Montello, Ford.
 42336....M. W. Johnson, Montello, Ford.
 42337....Geo. F. Tranter, Reno, Buick.
 42338....Lester D. Summerfield, Reno, Reo.
 42339....A. Dondero, Sr., Reno, Buick.
 42340....O. J. Owens, Lovelock, Dodge.
 42341....Oscar McMillan, Lovelock, Ford.
 42342....Catlin Shale Co., Elko, Ford Truck.
 42343....Catlin Shale Co., Elko, Overland.
 42344....F. K. Roberts, Elko, Chevrolet.
 42345....W. W. Parke, Lovelock, Dodge.
 42346....Tom P. Ebert, Lovelock, Oakland.
 42347....Herman L. Johnson, Lovelock, Ford.
 42348....W. S. Larsh, Ruth, Buick.
 42349....Genevieve L. Lyng, Reno, Ford.
 42350....Chester Anker, Lovelock, Chalmers.
 42351....Chester Anker, Lovelock, Ford.
 42352....Shufelt & Riley, Reno, Jeffery.
 42353....Shufelt & Riley, Reno, Ford.
 42354....W. G. Edwards, Reno, Reo.
 42355....Ray Lester, Reno, Chevrolet.
 42356....Dr. Ostroff, Reno, Scripps-Booth.
 42357....C. H. Karns, Reno, Scripps-Booth.
 42358....Nevada State Prison, Tonopah, Ford.
 42359....Mrs. C. Cardelli, Dayton, Chandler.
 42360....A. Selmi, Ft. Churchill, Dodge.
 42361....G. P. Griffith, Elko, Ford.
 42362....W. G. Larimer, Reno, Ford.
 42363....Roadside S. L. M. Co., Sharpe, Ford.
 42364....Shawk & Shawk, Schurz, Overland.
 42365....C. A. Starr, Reno, Oldsmobile.
 42366....H. Heitman, Gardnerville, Overland.
 42367....W. J. Shank, Reno, Haynes.
 42368....Alice McAndrews, Reno, Saxon.
 42369....Wm. A. Fawcett, Caliente, Chevrolet.
 42370....Jas. L. Humphrey, Reno, Franklin.
 42371....Geo. Heidtman, Gardnerville, Dodge.
 42372....C. R. Cooper, Reno, Dodge.
 42373....Alice J. Craven, Reno, Studebaker.
 42374....John Poco, Reno, Cadillac.
 42375....D. Felpelli, Reno, Oakland.
 42376....Joe Mongolo, Reno, Studebaker.
 42377....Carl Otto Hers, Reno, Cadillac.
 42378....J. F. Byer, Austin, Oakland.
 42379....St. John Laborde, Austin, Dodge.
 42380....D. J. Shea, Austin, Dodge.
 42381....O. J. Vannoy, Fallon, Dodge.
 42382....O. J. Vannoy, Fallon, Ford.
 42383....Ed. Von Tobel, Las Vegas, Hudson.
 42384....Von Tobel L. Co., Las Vegas, Oretion.
 42385....Thos. W. Chase, Sparks, Reo 6.
 42386....Paul Jones, Sparks, Haynes.
 42387....Chas. M. Reddy, Sparks, Hupmobile.
 42388....L. G. Clark, Elko, Essex.
 42389....E. Peterson, Reno, Oakland.
 42390....Henry H. Anderson, Reno, Roamer.
 42391....A. B. Ghiglieri, Reno, Oakland.
 42392....Walter L. Malone, Reno, Buick.
 42393....P. E. Groesbeck, Reno, Cadillac.
 42394....Groesbeck & O'Brien, Reno, Winton.
 42395....Groesbeck & O'Brien, Reno, Cadillac.
 42396....Groesbeck & O'Brien, Reno, U.S. Car Co.
 42397....E. K. Springer, Reno, Chevrolet.
 42398....W. T. Somerville, Tonopah, Ford.
 42399....S. S. Errett, Jr., Tonopah, Ford.
 42400....M. Galantuomini, Yerington, Buick.
 42401....F. H. Gove, Round Mountain, Ford.
 42402....Ghalmer McCormick, McDermitt, Ford.
 42403....C. F. Baber, McDermitt, Ford.
 42404....Raymond St. Clair, Reno, Roamer.
 42405....C. W. Crapster, Sparks, Ford.
 42406....E. F. Fowler, Reno, Overland.

- 42407...E. F. Fowler, Reno, EMF.
 42408...Dr. W. C. West, Reno, Willys 6.
 42409...Ed. Mattinson, Yerington, Ford.
 42410...John Kirkley, Reno, Essex.
 42411...A. E. Purvine, Smith, Ford.
 42412...Chas. Stroenider, Yerington, Dodge.
 42413...James Herrin, Yerington, Ford.
 42414...Frank Glom, Yerington, Ford.
 42415...Rhodes S. & B. Co., Mina, Garford.
 42416...T. C. Likins, Mina, Ford.
 42417...C. E. Moore, Moapa, Chevrolet.
 42418...H. J. Bishop, Carrara, Ford.
 42419...George Jeffs, Caliente, Ford.
 42420...Buckingham M. Co., Battle Mtn., Ford.
 42421...T. Cardelli, Dayton, Buick.
 42422...City of Reno, Reno, Oldsmobile.
 42423...City of Reno, Reno, Ford.
 42424...City of Reno, Reno, Ford.
 42425...City of Reno, Reno, Moreland.
 42426...City of Reno, Reno, Ford.
 42427...H. Settlemyer, Gardnerville, Chandler.
 42428...H. Settlemyer, Gardnerville, Ford.
 42429...Hunewill L. & L. Co., Wellington, Ford.
 42430...James T. McKay, Smith, Buick.
 42431...F. B. Mann, Hudson, Reno.
 42432...August Manke, Simpson, Ford.
 42433...E. J. Steiner, Smith, Ford.
 42434...Pearl B. Karaus, Yerington, Ford.
 42435...Joe N. Yokoyama, Yerington, Buick.
 42436...W. J. Freeman, Yerington, Dodge.
 42437...Mrs. A. L. Luce, Ludwig, Overland.
 42438...Mrs. E. H. Scott, Mason, Overland.
 42439...H. M. Pursel, Yerington, Buick.
 42440...V. L. Adams, Reno, Buick.
 42441...Willis D. Lockridge, Reno, Ford.
 42442...M. L. Lamb, Reno, Dodge.
 42443...F. A. Hewlett, Reno, Ford.
 42444...C. Ciofani, Reno, Oldsmobile.
 42445...H. J. Robertini, Reno, Maxwell.
 42446...William Martin, Reno, Ford.
 42447...F. S. Smith, Derby, Ford.
 42448...F. S. Smith, Derby, Oldsmobile.
 42449...W. Gillespie, Gardnerville, Chevrolet.
 42450...J. R. McCulloch, Fernley, Dodge.
 42451...Lester C. Munk, Lovelock, Chevrolet.
 42452...Malcolm Mahan, Lovelock, Overland.
 42453...Elkoro Mines Co., Jarbidge, Hudson.
 42454...Elkoro Mines Co., Jarbidge, Duplex.
 42455...Fred G. Bennighoff, Battle Mtn., Ford.
 42456...Crisp Bros., Jarbidge, Overland.
 42457...P. W. Otto, Jarbidge, Ford.
 42458...Nev-Sierra Bapt. Con., Reno, Ford.
 42459...C. N. Cray, Contact, Dodge.
 42460...Warren S. Hudson, Jarbidge, King.
 42461...O. Gerbiz, Hawthorne, Chevrolet.
 42462...Grace Sprague, Carson City, Essex.
 42463...C. W. Brooks, Reno, Studebaker.
 42464...C. W. Brooks, Reno, Ford.
 42465...Mrs. Sarah Roberts, Reno, Paige.
 42466...Forrest G. Whiting, Reno, Ford.
 42467...Handley Bros., Eureka, Ford.
 42468...Handley Bros., Eureka, Dodge.
 42469...John W. Johnson, Montello, Ford.
 42470...J. Redelius, Reno, Ford.
 42471...Damele & Damele, Tonkin, Reo.
 42472...Joseph H. Uhen, Battle Mtn., Metz.
 42473...Maurizio Pieretti, Tonkin, Studebaker.
 42474...Reno Grocer Co., Reno, Kleiber.
 42475...Reno Grocer Co., Reno, Federal.
 42476...Reno Grocer Co., Reno, Dodge.
 42477...W. H. Simmons, Reno, Hudson.
 42478...Thomas Gondolfo, Fallon, Ford.
 42479...D. W. Peters, Fallon, Chevrolet.
 42480...J. B. Cushman, Fallon, Buick.
 42481...Frank Wilson, Fallon, Buick.
 42482...Will Swift, Fallon, Hudson.
 42483...Olympic Mines Co., Omo, Cadillac.
 42484...Wm. Champagne, Sparks, Ford.
 42485...L. Cereri, Reno, Ford.
 42486...Victor Dondero, Reno, Ford.
 42487...A. T. Robinson, Reno, Ford.
 42488...Fred Newmarker, Reno, Ford.
 42489...J. H. Christman, Reno, Ford.
 42490...Sam Gibson, Reno, Chevrolet.
 42491...M. L. Soper, Fernley, Ford.
 42492...James Oliver, Stewart, Ford.
 42493...American Marble Co., Carrara, Ford.
 42494...Frank S. Mens, Stewart, Maxwell.
 42495...J. E. Threlkel, Reno, Allen.
 42496...Steptoe Grocery Co., East Ely, Ford.
 42497...Henry M. Fulmer, East Ely, Dodge.
 42498...W. L. Fulmer, East Ely, Dodge.
 42499...James Haley, Pioche, Haynes.
 42500...W. W. Anderson, Tonopah, Overland.
 42501...Martin Hachquet, Eureka, Chandler.
 42502...A. Saralagui, Reno, Cadillac.
 42503...J. P. Aldas & Co., Reno, Buick.
 42504...Mrs. I. A. Hartwick, Reno, Dodge.
 42505...A. J. O'Rourke, Reno, Dodge.
 42506...J. C. Harris, Elko, Dodge.
 42507...J. C. Harris, Elko, Hudson.
 42508...John F. Avanzini, Goldfield, Ford.
 42509...T. W. Dove, Tuscarora, Dodge.
 42510...Engliert Bros., Elko, Dodge.
 42511...Lou W. Engliert, Elko, Chandler.
 42512...S. Larson, Elko, Ford.
 42513...L. Wood, Fallon, Ford.
 42514...J. M. Heiser, Fallon, Ford.
 42515...D. D. Bease, Fallon, Metz.
 42516...Chas. W. Tucker, Fallon, Ford.
 42517...D. E. Anderson, Fallon, Buick.
 42518...S. B. Smart, Fallon, Dodge.
 42519...G. C. Howell, Fallon, Ford.
 42520...W. H. Trout, Fallon, Ford.
 42521...J. G. Pearl, Fallon, Ford.
 42522...C. F. Cooper, Pyramid, Oakland.
 42523...J. C. Scott, Sparks, Cadillac.
 42524...C. E. Corbiere, Sparks, Ford.
 42525...Oliver P. Taber, Sparks, Overland.
 42526...Mrs. G. R. Harrison, Sparks, Jackson.
 42527...S. Peterson, Sparks, Ford.
 42528...Sparks Transfer, Sparks, Ford.
 42529...Sparks Transfer Co., Sparks, Federal.
 42530...H. A. Singleton, Sparks, Ford.
 42531...A. L. Morrill, Reno, Buick.
 42532...Clarence Fisher, Nelson, Ford.
 42533...A. L. Marks, Reno, Ford.
 42534...Louis M. Calkins, Searchlight, Ford.
 42535...S. E. Mohatt, Lovelock, Metz.
 42536...G. E. McKenna, Goldfield, Dodge.
 42537...George A. Evans, Lovelock, Studebkr.
 42538...Vic Hancock, Mesquite, Ford.
 42539...W. H. Cooper, Las Vegas, Ford.
 42540...Thomas S. Powell, Las Vegas, Ford.
 42541...Troy Steam Laundry, Las Vegas, Ford.
 42542...Harry Blanding, Las Vegas, Ford.
 42543...Fred D. Stedden, East Ely, Ford.
 42544...Paul Weisse, Tonopah, Buick.
 42545...Ralph Wardie, Tonopah, Dodge.
 42546...Rasmus Maide, Tonopah, Ford.
 42547...Chas. W. Taylor, Tonopah, Peerless.
 42548...Dr. Wm. A. Blanck, Minden, Chandler.
 42549...John Scott, Ely, Ford.
 42550...Gust Johnson, Tonopah, Maxwell.
 42551...T. J. Abbott, Goldfield, Maxwell.
 42552...Pete Boko, Tonopah, Overland.
 42553...Hinkle Bros., Tonopah, Peerless.
 42554...G. L. Harma, Tonopah, Ford.
 42555...P. R. Whytock, Tonopah, Ford.
 42556...Geo. Quigley, Tonopah, Chevrolet.
 42557...Tony Brachett, Manhattan, Dodge.
 42558...Tony Brachett, Manhattan, Ford.
 42559...Stiles Bros., Beatty, Ford.
 42560...W. I. Ferguson, Reno, Pope Hartford.
 42561...Mrs. Nellie Emery, Goldfield, Ford.
 42562...Sam Courts, Round Mountain, Case.
 42563...D. E. Nostrosa, Eureka, Overland.
 42564...Frank Nostrosa, Eureka, Ford.
 42565...Gilbert Nostrosa, Eureka, Ford.
 42566...A. B. Moberg, Sparks, Buick.
 42567...Geo. Lehnert, Sparks, Ford.
 42568...First Nat. Bank, Winnemucca, Buick.
 42569...Leon Liotard, Winnemucca, Buick.
 42570...T. Arascada, Golconda, Haynes.
 42571...G. Miller, Sr., Willow Point, Ford.
 42572...G. Miller, Sr., Willow Point, Ford.
 42573...Mike Larraqeta, Winnemucca, Olds.
 42574...Dr. E. D. Giroux, Winnemucca, Buick.
 42575...Lawrence Miller, Willow Point, Ford.
 42576...Frank Krenkel, Winnemucca, Buick.
 42577...O. F. Blaut, Rebel Creek, Ford.
 42578...Carson Brewing Co., Carson, Ford.
 42579...Carson Brewing Co., Carson, Reo.
 42580...Carson Brewing Co., Carson, Ford.

- 42581....Carson Brewing Co., Carson, Ford.
 42582....Dr. G. C. Steinmiller, Reno, Cadillac.
 42588....Ernest Gilbert, Carson, Ford.
 42584....John Casci, Reno, Maxwell.
 42585....H. C. Helwink, Gardnerville, Overland.
 42586....Chris. Christoffersen, Minden, Buick.
 42587....W. C. Cardinal, Minden, Ford.
 42588....D. W. Ridenour, Reno, Dodge.
 42589....W. M. McCaffery, Reno, Hudson.
 42590....M. J. McShane, Mason, White.
 42591....S. A. Tolboe, Mason, Overland.
 42592....August Thies, Yerington, Chandler.
 42593....F. H. Meyers, Yerington, Ford.
 42594....Phil Kestell, Virginia, Reo.
 42595....Louisiana Con. M. Co., Tonopah, Duplex.
 42596....Louisiana Con. M. Co., Tonopah, Duplex.
 42597....Louisiana Con. M. Co., Tonopah, Duplex.
 42598....Louisiana Con. M. Co., Tonopah, Duplex.
 42599....Louisiana Con. M. Co., Tonopah, Duplex.
 42600....C. W. Nelson, Minden, Stutz.
 42601....Joe Getto, Fallon, Maxwell.
 42602....John Getto, Fallon, Maxwell.
 42603....John G. Rae, Lovelock, Ford.
 42604....F. M. Andrews, Luning, Buick.
 42605....H. L. Spencer, Rawhide, Republic.
 42606....H. L. Spencer, Rawhide, Republic.
 42607....H. L. Spencer, Rawhide, Ford.
 42608....W. R. Laughlin, Mason, Ford.
 42609....Fannie M. Waggoner, Yerington, Ovind.
 42610....A. Westdyk, Alamo, Ford.
 42611....W. O. Boles, Derby, Ford.
 42612....Purity French Bakery, Reno, Ford.
 42613....Gus Besso, Reno, Chalmers.
 42614....Milfred Hill, Lovelock, Buick.
 42615....Mrs. C. F. Erickson, Lovelock, Ford.
 42616....O. W. Ayers, Reno, Ford.
 42617....Nev. Eng. & Sup. Co., Reno, Dodge.
 42618....John O. Morris, Ruth, Buick.
 42619....Nev. Eng. & Sup. Co., Reno, Hup.
 42620....D. D. Sabala, Elko, Hudson.
 42621....Pete Corta, Jiggs, Hudson.
 42622....Nels Fauery, Elko, Nash.
 42623....Charles G. Lyon, Austin, Ford.
 42624....O'Toole Bros., Austin, Dodge.
 42625....T. Lampa & Co., Ione, Republic.
 42626....Manuel Olive, Austin, Oakland.
 42627....A. E. Miller, Goldfield, Oakland.
 42628....J. Emmett Walsh, Goldfield, Dodge.
 42629....John Witt, Goldfield, Chandler.
 42630....T. F. Dunn, Goldfield, Buick.
 42631....Wilson Bates Furn. Co., Ely, Meteor.
 42632....Wilson Bates Furn. Co., Ely, Buick.
 42633....Wilson Bates Furn. Co., Ely, Jeffery.
 42634....Wilson Bates Furn. Co., Ely, Ford.
 42635....Mutual Divide M. Co., Tonopah, Olds.
 42636....Mutual Divide M. Co., Tonopah, Chev.
 42637....Frank McDonnell, Tonopah, Ford.
 42638....W. D. Wright, Mina, Ford.
 42639....R. J. Swope, Fallon, Dodge.
 42640....H. A. Ringer, Fallon, Dodge.
 42641....Mrs. C. K. Harvey, Fallon, Ford.
 42642....W. P. Clark, Fallon, Dodge.
 42643....Royal Divide M. Co., Tonopah, GMC.
 42644....W. H. Bridges, Sparks, Overland.
 42645....John D. Ferris, Reno, Reo.
 42646....Frank Campbell, Reno, Ford.
 42647....Bert Weiden, Reno, Hupmobile.
 42648....Louis Yurfluh, Reno, Buick.
 42649....L. M. Christensen, Reno, Oakland.
 42650....Victor C. Freelove, Goodsprings, Ford.
 42651....I. W. Harmon, Bunkerville, Ford.
 42652....Int. Properties Syn., Las Vegas, Dodge.
 42653....Spanish Belt M. Co., Tonopah, Duplex.
 42654....Wm. F. Laurence, Tonopah, Hudson.
 42655....Toney Martelletti, Tonopah, Cadillac.
 42656....F. F. Garside, Tonopah, Buick.
 42657....A. S. Henderson, Las Vegas, Buick.
 42658....Theo. Craig, Jean, Ford.
 42659....Theo. Craig, Jean, Ford.
 42660....Theo. Craig, Jean, Buick.
 42661....Henry A. Paulsen, Fallon, American.
 42662....W. E. Hales, Tonopah, Ford.
 42663....H. M. Hornberger, Tonopah, Saxon.
 42664....Louie King, Reno, Buick.
 42665....Dudley Kline, Reno, Ford.
 42666....Dr. John A. Lewis, Reno, Chandler.
 42667....Chas. L. Johnson, Jr., Reno, Hudson.
 42668....Shearer E. & Supply Co., Reno, Ford.
 42669....Shearer E. & Supply Co., Reno, Ford.
 42670....C. H. Wagner, Reno, Buick.
 42671....C. V. Teberg, Sparks, Overland.
 42672....Frank Zunino, Reno, Republic.
 42673....Jose Davis M. Co., Lovelock, Ford.
 42674....Morris E. Cousin, Reno, Studebaker.
 42675....G. M. Gardner, Reno, Studebaker.
 42676....R. C. Henderson, Planigan, Chevrolet.
 42677....C. A. Stone, Sparks, Willys 6.
 42678....A. Panelli, Verdi, Buick.
 42679....Grace Wildes, Fallon, Overland.
 42680....E. D. Frazzini, Fallon, Ford.
 42681....W. L. Nygren, Fallon, Chevrolet.
 42682....Warren Miller, Fallon, Buick 4.
 42683....Byron Morrish, Reno, Overland.
 42684....Frank Charlebois, Yerington, Ford.
 42686....Nevada State Police, Carson, Ford.
 42686....John Rubke, Carson City, Maxwell.
 42687....Dacey Jim, Palisade, Ford.
 42688....A. F. Marker, Fallon, Ford.
 42689....Mrs. T. L. Jones, Reno, Ford.
 42690....D. Pecetto, Las Vegas, Studebaker.
 42691....American Red Cross, Yerington, Ford.
 42692....Mrs. A. L. Candee, Fallon, Ford.
 42693....R. W. Wells, Fallon, Ford.
 42694....Henry Philips, Fallon, Dodge.
 42695....I. C. Johnson, Las Vegas, Ford.
 42696....I. C. Johnson, Las Vegas, Ford.
 42697....W. B. Morrow, Las Vegas, Buick.
 42698....W. G. Morse, Las Vegas, Ford.
 42699....J. G. Maravey, Las Vegas, Ford.
 42700....Chas. Kennedy, Goodsprings, Ford.
 42701....E. V. Black, Deeth, Dodge.
 42702....H. G. Curtis, Elko, Dodge.
 42703....Geo. E. Hendri, Las Vegas, Ford.
 42704....Henrietta M. Allen, Reno, Ford.
 42705....R. L. Middleton, Pioche, Ford.
 42706....Clyde Mathews, Panaca, Chevrolet.
 42707....Ernest Gentry, Caliente, Ford.
 42708....Wm. Crisp, Jarbridge, Ford.
 42709....A. F. Adams, Ely, Overland.
 42710....N. H. Chapin, Ely, Oldsmobile.
 42711....Carl J. Morabe, Tonopah, Overland.
 42712....A. W. Geiger, Mina, Dodge.
 42713....McCurdy & Geiger, Mina, Ford.
 42714....Maurice Downey, Omeo, Maxwell.
 42715....Harry Dale, Las Vegas, Chevrolet.
 42716....M. I. Newkirk, Las Vegas, Ford.
 42717....Ed. J. Wren, Tonopah, Dorris.
 42718....Carl Feutsch, Tonopah, Hup.
 42719....R. M. French, Tonopah, Chandler.
 42720....William T. Ellis, Goodsprings, Ford.
 42721....Charles W. Wheeler, Reno, Saxon.
 42722....J. M. Lytle, Overton, Ford.
 42723....I. Schutz, Reno, Studebaker.
 42724....J. H. Carter, Lee, Hudson.
 42725....Wm. M. Donovan, Silver City, Dodge.
 42726....Albert Gremes, Virginia, Ford.
 42727....Nev. Wonder M. Co., Wonder, Appran.
 42728....Nev. Wonder M. Co., Wonder, Dorris.
 42729....E. F. Fetic, Genoa, Ford.
 42730....E. V. Fetic, Genoa, Ford.
 42731....Martin Sutor, Virginia, Studebaker.
 42732....A. B. Karns, Carson City, Chevrolet.
 42733....Father Horgan, Carson City, Ford.
 42734....James E. Powell, Gardnerville, Hudson.
 42735....Jake Sikori, Mason, Ford.
 42736....C. G. Altman, Yerington, Ford.
 42737....Carlo Barbalas, Yerington, Ford.
 42738....Wm. Graunke, Gardnerville, Dodge.
 42739....Herman Luhman, Minden, Chevrolet.
 42740....W. D. Ritchford, Gardnerville, Buick.
 42741....Dick Wenholdt, Gardnerville, Ford.
 42742....Robert Maltry, Minden, Ford.
 42743....L. Larentzen, Gardnerville, Hudson.
 42744....Mrs. J. F. Lloyd, Gardnerville, Dodge.
 42745....D. L. Jones, Gardnerville, Buick.
 42746....Wm. Scheele, Gardnerville, Dodge.
 42747....Chris Jeppersen, Gardnerville, Studeb.
 42748....Mrs. L. S. Mason, Reno, Studebaker.
 42749....Oscar Shellman, Reno, Ford.
 42750....Bill S. Schooley, Reno, Ford.
 42751....See 41128 (original lost).
 42752....Geo. D. Mitchell, Reno, Ford.
 42753....Hazel Perry, Tonopah, Dodge.
 42754....Bert Thomason, Reno, Ford.

- 42755...Mrs. L. McCarthy, Tonopah, Dodge.
 42756...E. E. Wardin, Reno, Mitchell.
 42757...C. H. Hancock, Fallon, Buick.
 42758...L. C. Fisher, Fallon, Grant.
 42759...Wayne Young, Fallon, Franklin.
 42760...Peter Nygren, Fallon, Ford.
 42761...Mrs. A. J. Aikens, Fallon, Stearns-K.
 42762...John A. Healy, Fallon, Maxwell.
 42763...D. E. Yeary, Stillwater, Hupmobile.
 42764...F. A. Dalton, Stillwater, Buick.
 42765...Geo. E. Roth, Goodsprings, Buick.
 42766...L. L. Leonard, Reno, Lozier.
 42767...Hugh Leonard, Tonopah, Hupmobile.
 42768...Walter W. Ross, Tonopah, Ford.
 42769...E. R. Green, Elko, Oldsmobile.
 42770...Joseph Baille, Charleston, Dodge.
 42771...M. Montes, Reno, Dodge.
 42772...W. K. Ballantine, Elko, Chevrolet.
 42773...A. H. Berning, Carlin, Ford.
 42774...Fred Ruffi, Battle Mountain, Ford.
 42775...J. H. Sliger, Carrara, Buick.
 42776...John Salsbury, Goldfield, Ford.
 42777...J. C. Jewell, Goldfield, Ford.
 42778...W. H. Dietz, Goldfield, Ford.
 42779...R. T. Armstrong, Goldfield, Oakland.
 42780...Ben Hur Div. M. Co., Tonopah, Ford.
 42781...Keystone Divide M. Co., Tonopah, Ford.
 42782...Campbell Kelly, Inc., Tonopah, Rep.
 42783...R. J. Kelly, Tonopah, Hudson.
 42784...Campbell Kelly, Inc., Tonopah, W.-U.
 42785...C. W. Mitchell, Elko, Oldsmobile.
 42786...C. W. Mitchell, Elko, Cadillac.
 42787...Mrs. Mildred Nelson, Elko, Chevrolet.
 42788...Frank Stephens, Fallon, Chevrolet.
 42789...Frank Armas, Stillwater, Oldsmobile.
 42790...Dr. S. S. Jarrett, Carson City, Oldsmo.
 42791...Washoe L. & C. Co., Reno, Reo.
 42792...Dr. F. W. Hodgins, Virginia, Chevrolet.
 42793...Dr. W. J. Lawson, Virginia, Reo.
 42794...F. A. Strauss, Virginia, Chevrolet.
 42795...John Oats, Fallon, Oldsmobile.
 42796...C. L. Geiger, Wonder, Ford.
 42797...P. S. Jensen, Reno, Chalmers.
 42798...P. S. Jensen, Reno, Ford.
 42799...P. S. Jensen, Reno, Hudson.
 42800...Mrs. J. Zabricki, Tonopah, Chevrolet.
 42801...A. G. Meyers, Carson City, Ford.
 42802...A. G. Meyers, Carson City, Ford.
 42803...O. R. McGinty, Reno, Ford.
 42804...Tony Farias, Yerington, Overland.
 42805...Geo. B. Osborne, Mason, Ford.
 42806...Frank Perry, Mason, Dodge.
 42807...R. T. Forrester, Reno, Ford.
 42808...F. A. McCafferty, Reno, Studebaker.
 42809...Amelia Howard, Reno, Studebaker.
 42810...Mrs. B. F. Howard, Reno, Chevrolet.
 42811...U. M. Slater, Inc., Reno, Ford.
 42812...V. E. Scott, Reno, Chevrolet.
 42813...A. J. Mergen, Reno, Oldsmobile.
 42814...Richard L. Morris, Reno, Scripps-B.
 42815...John Chism, Reno, Federal.
 42816...John Chism, Reno, Federal.
 42817...John Chism, Reno, Ford.
 42818...John Chism, Reno, Ford.
 42819...John Chism, Reno, Ford.
 42820...John Chism, Reno, Ford.
 42821...John Chism, Reno, Ford.
 42822...John Chism, Reno, Haynes.
 42823...W. R. Rohrecht, Reno, Essex.
 42824...Harry Fray, Reno, Ford.
 42825...Geo. R. Worn, Reno, Reo.
 42826...E. F. Knudsen, Golconda, Overland.
 42827...F. A. Cropley, Golconda, Ford.
 42828...H. E. Bureh, Hilltop, Oldsmobile.
 42829...A. C. Lyon, Wells, Ford.
 42830...R. Ralph, Wells, Ford.
 42831...John Ralph, Wells, Ford.
 42832...E. P. Haymond, Wells, Reo.
 42833...R. M. Steele, Wells, Cadillac.
 42834...J. Poncia, Sparks, Dodge.
 42835...Land Dev. Co., Battle Mountain, Ford.
 42836...Bruce Connelly, Reno, Buick.
 42837...Lee Henderson, Reno, Ford.
 42838...Frank Pardini, Reno, Ford.
 42839...Manuel J. DeSouza, Reno, Ford.
 42840...Mrs. A. E. Dunn, Reno, Buick.
 42841...F. D. Madelana, Reno, Ford.
 42842...French Cleaners, Reno, Ford.
 42843...Chas. E. LeClare, Reno, Reo.
 42844...W. Rittinger, Reno, Chevrolet.
 42845...C. B. McGee, Reno, Chevrolet.
 42846...C. S. Saughton, Reno, Reo.
 42847...E. H. Tocque, Reno, Chevrolet.
 42848...L. Devincenzi, Reno, Studebaker.
 42849...L. Devincenzi, Reno, Ford.
 42850...J. D. Oliver, Nixon, Lexington.
 42851...Ernest Uren, Battle Mountain, Ford.
 42852...James R. Mardis, Reno, Pratt.
 42853...Commercial Soap Co., Reno, Ford.
 42854...B. F. Smith, Silver Peak, Ford.
 42855...John Shell, East Ely, Buick.
 42856...J. F. Vieira, Lovelock, Overland.
 42857...John J. Pendergast, Packard, Ford.
 42858...Al. Annett, Mina, Oakland.
 42859...B. F. Baker, Mina, Hudson 6.
 42860...Al. Annett, Mina, Duplex.
 42861...D. A. Smith, M.D., Mina, Essex.
 42862...E. W. Brown, Mina, Buick.
 42863...Alex Chisholm, Mason, Ford.
 42864...Nevada Valleys P. Co., Lovelock, Reo.
 42865...Wm Holbrook, Wellington, Ford.
 42866...Tokyo Laundry, Carson City, Ford.
 42867...R. M. Bradley, Tonopah, Ford.
 42868...Fred Fricke, Gardnerville, Buick.
 42869...J. B. Williams, Carson City, Buick.
 42870...Yuchasti Castro, Ione, Oakland.
 42871...Mercury M. Co., Ione, Buick.
 42872...Theo. Ascargorta, Ione, Chevrolet.
 42873...J. C. Meyer, Reno, Dodge.
 42874...E. C. Murphy, Deeth, Hudson.
 42875...M. M. Murphy, Deeth, Overland.
 42876...J. A. Cardinal, Minden, Buick.
 42877...Earl H. Lovejoy, Reno, Ford.
 42878...Angelo Digno, Yerington, Ford.
 42879...C. J. Monahan, Yerington, Overland.
 42880...C. J. Monahan, Yerington, Ford.
 42881...Ray Hilton, Reno, Ford.
 42882...G. W. Morris, Reno, Overland.
 42883...Frank J. Rivers, Reno, Ford.
 42884...Joe Brunetti, Reno, Ford.
 42885...Emilio Brunetti, Reno, Ford.
 42886...J. E. Martin, Reno, Hudson.
 42887...J. E. Martin, Reno, Ford.
 42888...Arthur Fasani, Reno, Ford.
 42889...A. A. Baroni, Reno, Haynes.
 42890...E. S. Farrington, Carson, Franklin.
 42891...Louis Saroni, Wellington, Ford.
 42892...Dept. of Highways, Carson, Studebkr.
 42893...Manuel Goni, Carson City, Velle.
 42894...George L. Sanford, Carson, Haynes.
 42895...Riverside Mill Co., Reno, Dodge.
 42896...J. Lukey, Reno, Oakland.
 42897...Peter Etchegoin, Reno, Dodge.
 42898...E. H. Proctor, Sparks, Oakland.
 42899...Wm. F. Leonard, Sparks, Buick.
 42900...A. Semenza, Sparks, Oakland.
 42901...H. Harris, Sparks, Ford.
 42902...M. L. Smith, East Ely, Franklin.
 42903...F. O. Vanover, Duckwater, Ford.
 42904...J. C. Thompson, Searchlight, Hupmo.
 42905...C. E. Lord, M.D., Ruth, Dodge.
 42906...M. W. Jelinek, Fallon, Ford.
 42907...R. A. Leberski, Elko, Essex.
 42908...R. A. Leberski, Elko, Ford.
 42909...C. H. Bushnell, Elko, Overland.
 42910...J. B. Gelder, Yerington, Hupmobile.
 42911...Sam Tidball, Ruth, Studebaker.
 42912...John Thomas, Reno, Chevrolet.
 42913...Dewey Tang, Round Mountain, Ford.
 42914...H. H. March, Fallon, Chevrolet.
 42915...D. E. Anderson, Fallon, Ford.
 42916...John Blair, Eureka, Ford.
 42917...Cliff Goad, Battle Mountain, Overland.
 42918...Wallace Bailey, Romano, Ford.
 42919...Wm. A. Roberts, Austin, Ford.
 42920...James Roberts, Austin, Maxwell.
 42921...C. Trethewey, Austin, Dodge.
 42922...Mary Shane, Fallon, Chevrolet.
 42923...Henry M. Hoyt, Reno, Hudson.
 42924...C. C. Jones, Reno, Reo.
 42925...D. W. Gault, Reno, Ford.
 42926...A. C. Arneson, Verdi, Chevrolet.
 42927...Lewis Sharp, Arthur, Studebaker.
 42928...Z. Dondero, Reno, Lexington.

- 42929...R. H. Pooley, Goldfield, Buick.
 42930...J. Harold Ginney, Goldfield, Ford.
 42931...K. M. Becker, Sparks, Studebaker.
 42932...Mrs. W. G. Gammon, Sparks, Ford.
 42933...Mrs. W. G. Gammon, Sparks, Overland.
 42934...F. P. Strassburg, Fallon, Overland.
 42935...Lester R. Page, Fallon, Oldsmobile.
 42936...A. J. Caton, Reno, Studebaker.
 42937...M. D. Crosby, Wadsworth, Chevrolet.
 42938...Booth B. Goodman, Lovelock, Oakland.
 42939...E. Reinhart, Golconda, Ford.
 42940...Ed. Uren, Jr., Battle Mtn., Chevrolet.
 42941...Ed. Uren, Jr., Battle Mtn., Ford.
 42942...A. D. Dern, Winnemucca, Dodge.
 42943...Hotel Nevada M. Co., Las Vegas, Ford.
 42944...J. M. Miller, Las Vegas, Ford.
 42945...E. J. Narcutt, Fallon, Ford.
 42946...S. B. Thornton, Fallon, Ford.
 42947...J. W. Danielson, Fallon, Ford.
 42948...W. H. Collins, Tonopah, Dodge.
 42949...T. J. Flynn, Tonopah, Nash.
 42950...Allen P. Norton, Vya, Ford.
 42951...R. P. Arnold, Ely, Studebaker.
 42952...Ely Lbr. & Coal Co., Ely, Ford.
 42953...Ely Lbr. & Coal Co., Ely, Ford.
 42954...R. H. Holtaman, Ely, Oldsmobile.
 42955...James Kantz, Kimberly, Ford.
 42956...O. T. Pagel, Ely, Maxwell.
 42957...E. Aiazzi, Yerington, Ford.
 42958...A. H. Farbush, Yerington, Chevrolet.
 42959...Fred Santena, Yerington, Maxwell.
 42960...Sam Barbarino, Yerington, Ford.
 42961...C. S. Durand, Yerington, Ford.
 42962...Thomas Ross, Yerington, Dodge.
 42963...H. C. Reedall, Goldfield, Maxwell.
 42964...R. J. McCarthy, Goldfield, Ford.
 42965...C. D. Bell, Goldfield, Ford.
 42966...C. D. Bell, Goldfield, Buick.
 42967...A. M. Beebe, Reno, Jeffery.
 42968...L. Westfall, Reno, Auburn.
 42969...L. Westfall, Reno, Dodge.
 42970...Nick Bryanovich, Reno, Saxon.
 42971...Croesman & Tavelle, Deeth, Overland.
 42972...Ward E. Taylor, Reno, Essex.
 42973...Mrs. Dr. W. E. Yancey, Reno, Haynes.
 42974...A. L. Loughton, Reno, Stevens-Duryea.
 42975...A. P. Candor, Reno, Ford.
 42976...A. L. Loughton, Reno, Ford.
 42977...E. S. Heward, Reno, Ford.
 42978...Verdi Lumber Co., Tonopah, Ford.
 42979...Ed. Millard, Ely, Franklin.
 42980...F. W. Millard, Ely, Hudson.
 42981...J. H. Gallagher, Ely, Dodge.
 42982...Verdi & Revert M. Co., Tonopah, Hud.
 42983...R. O. Haughtaling, Tonopah, Ford.
 42984...R. G. Williams, Tonopah, Oakland.
 42985...A. L. Nugent, Tonopah, Ford.
 42986...C. R. Douglass, Tonopah, Overland.
 42987...H. A. Geissendorfer, Tonopah, Ford.
 42988...R. E. Turner, Round Mtn., Chevrolet.
 42989...J. H. Denny, Tonopah, EMF.
 42990...Matt T. Kennedy, Ione, Ford.
 42991...E. N. McKelvey, Tonopah, Ford.
 42992...M. J. McVeigh, Tonopah, Ford.
 42993...Florence M. Read, Reno, Dodge.
 42994...L. E. Dunlap, Sparks, Buick.
 42995...E. Zamboni, Reno, Ford.
 42996...Geo. J. Lewis, Tonopah, Hudson.
 42997...Chas. N. Cheney, Sparks, Buick.
 42998...Norman M. Cheney, Sparks, Ford.
 42999...W. A. Stants, Lovelock, Studebaker.
 43000...M. Hart, Hazen, Hupmobile.
 43001...James M. Leonard, Virginia, Studebaker.
 43002...Charley Sam, Virginia, Ford.
 43003...S. Urrutia, Dayton, Buick.
 43004...V. E. Dignon, Carson, Ford.
 43005...Mrs. M. Marker, Lovelock, Baker Elec.
 43006...Chas. T. Williams, Hilltop, Ford.
 43007...D. Cladianos, Reno, Ford.
 43008...R. C. Johnston, Ione, Ford.
 43009...R. C. Johnston, Ione, Ford.
 43010...Paul Kolstrup, Stillwater, Dort.
 43011...L. J. Gorr, Lovelock, Ford.
 43012...Dr. J. W. Gerow, Reno, Reo.
 43013...Dr. J. W. Gerow, Reno, Chevrolet.
 43014...Chris. Helwinkel, Gardnerville, Buick.
 43015...Chris. Helwinkel, Gardnerville, Ford.
 43016...H. W. F. Luhra, Minden, Buick.
 43017...Henry Stork, Gardnerville, Buick.
 43018...Adolph Wehrman, Gardnerville, Ford.
 43019...F. R. Howard, Gardnerville, Ford.
 43020...Henry Wehrman, Gardnerville, Dodge.
 43021...Fred J. Rich, Gardnerville, Chevrolet.
 43022...Raymond Borda, Gardnerville, Buick.
 43023...R. E. Rufener, Gardnerville, Ford.
 43024...August Kettenberg, Sheridan, Overind.
 43025...Pedrojetti Bros., Gardnerville, Buick.
 43026...Peter Van Sickle, Minden, Buick.
 43027...C. W. Jacobsen, Gardnerville, Dodge.
 43028...Wm. Gansberg, Sheridan, Ford.
 43029...Henningsen Bros., Gardnerville, Natnl.
 43030...Wm. Rabe, Gardnerville, Overland.
 43031...C. H. Behrman, Gardnerville, Buick.
 43032...Reno Taxi, Reno, Reo.
 43033...Reno Taxi, Reno, Reo.
 43034...James J. Berryman, Reno, Buick.
 43035...John Gandie, Reno, Oakland.
 43036...Jack Pettie, Reno, Oakland.
 43037...H. W. Atchison, Gardnerville, Chalmers.
 43038...Herman Springmeyer, Minden, Buick.
 43039...Wm. Bartels, Minden, Overland.
 43040...Wm. Hussman, Gardnerville, Buick.
 43041...Wm. Hussman, Gardnerville, Buick.
 43042...S. Dack, Gardnerville, Ford.
 43043...J. L. Hoffman, Gardnerville, Ford.
 43044...Godfrey Cardinal, Minden, Ford.
 43045...F. W. Stodieck, Gardnerville, Buick.
 43046...F. W. Stodieck, Gardnerville, Buick.
 43047...W. T. Street, Reno, Dodge.
 43048...Joe Beebe, Reno, Dodge.
 43049...Xmas Con. M. Co., Jean, Ford.
 43050...Dunham, Car. & Hay., Reno, Dodge.
 43051...C. A. Smith, Carson, Studebaker.
 43052...Carl Hansen, Simpson, Dodge.
 43053...E. A. Bates, Ely, Maxwell.
 43054...Alfred Bellander, Baker, Chandler.
 43055...John W. Hockett, Ely, Ford.
 43056...L. H. Murdock, Ely, Marmon.
 43057...Joshua M. Fox, Shoshone, Chevrolet.
 43058...Neph Hampton, Shoshone, Ford.
 43059...R. T. Swallow, Shoshone, Reo.
 43060...A. F. Mantey, Ely, Overland.
 43061...W. A. Ray, Tonopah, Buick.
 43062...S. A. Kimmel, Tonopah, Dodge.
 43063...Walter E. Fuller, Tonopah, Overland.
 43064...T. A. Musante, Tonopah, Dodge.
 43065...J. Roberts, Tonopah, Ford.
 43066...Mrs. M. Harrington, Tonopah, Buick.
 43067...James Hearald, Tonopah, Ford.
 43068...John B. McCann, Tonopah, Buick.
 43069...S. T. Kelso, Hawthorne, Overland.
 43070...Robert Overman, Thorne, Ford.
 43071...J. M. Krippner, Hawthorne, Dodge.
 43072...F. B. Balzar, Hawthorne, Dodge.
 43073...Elmer E. Conlin, Ely, Oldsmobile.
 43074...Oswald Riley, Las Vegas, Chevrolet.
 43075...William Roan, Las Vegas, Ford.
 43076...James Sommerville, Las Vegas, Ford.
 43077...A. Boroli, Reno, Oakland.
 43078...J. W. Gill, Fallon, Chevrolet.
 43079...Edgar C. Smith, Fallon, Buick.
 43080...Edward Bickmore, Fallon, Oakland.
 43081...Thomas Dolf, Fallon, Hudson.
 43082...John Hellum, Fallon, Overland.
 43083...A. Weishaupt, Stillwater, Ford.
 43084...Charley Shepard, Fallon, Ford.
 43085...John Shepard, Fallon, Ford.
 43086...A. B. Nichols, Fallon, Dodge.
 43087...Churchill County Bank, Fallon, Ford.
 43088...Black Panther M. Co., Reno, Olds.
 43089...R. D. Eichelberger, Reno, Studebaker.
 43090...W. J. Hunting, Carson, Overland.
 43091...Sol. J. Lachman, Reno, Willys-Knight.
 43092...Sierra Furniture Co., Reno, Chevrolet.
 43093...A. McMillan, Wabuska, Ford.
 43094...C. L. Neely, Elko, Buick.
 43095...R. W. Hesson, Elko, Studebaker.
 43096...A. W. Hesson, Elko, Studebaker.
 43097...Fernando Giocoechea, Elko, Studebaker.
 43098...Vecinte Juriati, Elko, Studebaker.
 43099...William Mariluch, Elko, Studebaker.
 43100...C. H. Lewis, Deeth, Studebaker.
 43101...Alice Paddison, Mountain City, Buick.
 43102...Mrs. M. Dowd, Sparks, Dorris.

43103. R. R. McKay, Reno, Buick.
 43104. Paul Bassett, Packard, Ford.
 43105. Harry Hall Scheeline, Reno, Buick.
 43106. Gust Boost, Montello, Hudson.
 43107. B. Losto, Goldfield, Buick.
 43108. A. H. Lawry, Goldfield, Chalmers.
 43109. Horace J. Brown, Goldfield, Buick.
 43110. Mrs. H. A. Abbott, Verdi, Scripps-B.
 43111. J. T. Harry, East Ely, Chevrolet.
 43112. Mrs. Jack Elledge, Reno, Hudson.
 43113. Nora Clark, Reno, Maxwell.
 43114. Mrs. J. B. Goodwin, Reno, Ford.
 43115. Tony Borai, Reno, Buick.
 43116. Larsh Rumburg, Ely, Chalmers.
 43117. E. C. Whipp, Ruth, Dodge.
 43118. Otto F. Schwartz, Goodsprings, Essex.
 43119. Casinelli & Silva, Sparks, Ford.
 43120. W. A. Kent, Contact, Dodge.
 43121. Mathews Cash Grocery, Reno, Ford.
 43122. E. B. Price, Goodsprings, Ford.
 43123. Mrs. Grace E. Swander, Elko, Ford.
 43124. Dan J. Riordan, Jiggs, Reo.
 43125. J. R. Eby, Elko, Dodge.
 43126. C. E. Hillbun, Yerington, Ford.
 43127. A. C. Lundergreen, Yerington, Ford.
 43128. Mrs. Chas. Hobbins, Reno, Oldsmobile.
 43129. Mrs. H. Hanley, Reno, Overland.
 43130. William Fund, Reno, Studebaker.
 43131. Jos. Gerard, Reno, Chevrolet.
 43132. W. H. Caughlin, Reno, Buick.
 43133. Jacob Bros., Reno, Chevrolet.
 43134. Dana McGowan, Reno, Ford.
 43135. Angelo Troisi, Reno, Ford.
 43136. C. P. Ramelli, Reno, Ford.
 43137. C. J. Fairchild, Reno, Ford.
 43138. C. J. Fairchild, Reno, Ford.
 43139. Clio Lumber Co., Reno, Ford.
 43140. Nevada Stor. Bat. Co., Reno, Hupmo.
 43141. Geo. W. Gill, Reno, Chevrolet.
 43142. R. W. Varnon, Reno, Reo.
 43143. Charles H. Conerty, Sparks, Ford.
 43144. Augusta G. Ingalls, Wadsworth, Ford.
 43145. Joe Sustacha, Lamaille, Studebaker.
 43146. Griswold & Henderson, Elko, Mack.
 43147. Chas. Dressi, Elko, Studebaker.
 43148. F. S. Gedney, Elko, Cole Aero.
 43149. Roy W. Stoddard, Reno, Oldsmobile.
 43150. D. Quilled, Dayton, Buick.
 43151. Geo. E. Kitzmeyer, Carson, Sayers-Seov.
 43152. Geo. E. Kitzmeyer, Carson, Buick.
 43153. W. H. Johnston, Reno, Chandler.
 43154. Mrs. C. J. Sharon, Virginia, Buick.
 43155. Wm. Carlisle, Yerington, Ford.
 43156. Steven A. Scanavino, Mason, Ford.
 43157. Mason Merc. Co., Mason, Republic.
 43158. Mason Merc. Co., Mason, Ford.
 43159. Wm. Tholke, Gardnerville, Buick.
 43160. Donatilli & Pini, Yerington, Ford.
 43161. Louis Fabri, Yerington, Buick.
 43162. Henry Robbins, Goodsprings, White.
 43163. Henry Robbins, Goodsprings, Hup.
 43164. Dr. J. E. Nave, Reno, Ford.
 43165. J. W. Young, Reno, Maxwell.
 43166. Clarence Farnsworth, Reno, Hudson.
 43167. H. E. Smith, Virginia, Ford.
 43168. Fred Frantzen, Gardnerville, Dodge.
 43169. Harry F. Kendall, Fallon, Chevrolet.
 43170. R. H. Foote, Fallon, Chevrolet.
 43171. A. L. Baker, Fallon, Overland.
 43172. A. G. Whisenaur, Fallon, Ford.
 43173. George Edson Porter, Fallon, Chevrolet.
 43174. I. D. McCormick, Fallon, Chevrolet.
 43175. R. R. Robinson, Fallon, Chevrolet.
 43176. J. A. Wood, Fallon, Maxwell.
 43177. Thos. J. Wilson, Fallon, Ford.
 43178. C. B. Rice, Fallon, Ford.
 43179. W. E. Conrad, Fallon, Studebaker.
 43180. Mary E. Mackendon, Lovelock, Reo.
 43181. A. J. Gardiner, Rawhide, Ford.
 43182. C. W. Foote, Fallon, Marmon.
 43183. Esther Gault, Fallon, Maxwell.
 43184. Mrs. E. C. Eustace, Mina, Essex.
 43185. General Mines Co., Rochester, Ford.
 43186. John Fathergill, Churchill, Buick.
 43187. W. E. Warren, Yerington, Buick.
 43188. John H. Hanschild, Reno, Overland.
 43189. O. F. Amburn, Reno, Oldsmobile.
 43190. J. A. Cole, Reno, Franklin.
 43191. E. J. Heidtmann, Reno, Overland.
 43192. Edward C. Barsa, Reno, Dodge.
 43193. Edward C. Barsa, Reno, Dodge.
 43194. Oliver H. McTaggart, Reno, Ford.
 43195. Oscar H. Hammonds, Reno, Empire.
 43196. Robert Rae, Jr., Reno, Ford.
 43197. F. L. Fry, Beowawe, Buick.
 43198. D. States, Eureka, Ford.
 43199. Antone Zunino, Jiggs, Dodge.
 43200. D. W. McKenzie, Yerington, Hupmo.
 43201. W. H. Boman, Hazen, Studebaker.
 43202. Copper C. M. Co., Battle Mtn., Dodge.
 43203. Copper C. M. Co., Battle Mtn., Packard.
 43204. Copper C. M. Co., Battle Mtn., Ford.
 43205. Copper C. M. Co., Battle Mtn., Ford.
 43206. John J. Mitchell, Tonopah, Ford.
 43207. U. S. Indian Service, Schurz, Ford.
 43208. Steve Bell, Carson City, Maxwell.
 43209. Hendrix Bros., Sunnyside, Dodge.
 43210. Mrs. Ella Booth, Tonopah, Dodge.
 43211. Mrs. C. H. Atherton, Carson, Dodge.
 43212. Geo. J. Wright, Virginia, Reo.
 43213. Frank Tessier, Lovelock, Buick.
 43214. V. A. Twigg, Lovelock, Reo.
 43215. E. A. Perez, Lovelock, Reo.
 43216. E. A. Perez, Lovelock, Ford.
 43217. Alvin Hendrickson, Lovelock, Studebkr.
 43218. Frank Tully, Lovelock, Reo.
 43219. Louis Greleich, Lovelock, Dodge.
 43220. Louis Greleich, Lovelock, Ford.
 43221. Purty Dairy, Lovelock, Ford.
 43222. Geo. Stokn, Lovelock.
 43223. Valley Con. Co., Lovelock, Reo.
 43224. Clem Raetz, Lovelock, Ford.
 43225. Cash Grocery, Lovelock, Ford.
 43226. Cooper & Uniacke, Lovelock, Dodge.
 43227. Leland Cooper, Lovelock, Ford.
 43228. J. L. Kelly, Battle Mtn., Buick.
 43229. Charles B. Kappler, Carlin, Dodge.
 43230. W. W. Weathers, Deeth, Oakland.
 43231. Ed. Hancock, Reno, Maxwell.
 43232. W. E. Gould, Reno, Studebaker.
 43233. Carl Wasserbach, Las Vegas, Ford.
 43234. Mrs. R. A. Hash, Battle Mtn., Buick.
 43235. J. W. Weathers, Deeth, Oldsmobile.
 43236. C. Madresto, Elko, Hudson.
 43237. Pioche L. & M. Co., Pioche, Ford.
 43238. H. I. Olinghouse, Pioche, Ford.
 43239. H. I. Olinghouse, Pioche, Dodge.
 43240. Mayer Hotel Co., Elko, Chandler.
 43241. John A. McBride, Elko, Kissel.
 43242. W. W. Bixby, Reno, Dodge.
 43243. Marres Summer, Tonopah, Ford.
 43244. Mrs. F. P. Carroll, Tonopah, Overland.
 43245. Floy A. Gibson, Las Vegas, Ford.
 43246. Thos. J. Hickling, Las Vegas, Saxon.
 43247. Henry Brendel, Tonopah, Ford.
 43248. W. T. Elliott, Tonopah, Ford.
 43249. Wm. Earnst, Tonopah, Ford.
 43250. David Erkid, Fallon, Ford.
 43251. W. W. Perkins, Logandale, Ford.
 43252. E. F. Rathbun, Ely, Ford.
 43253. Dan W. Pitt, Lovelock, Ford.
 43254. Manuel Melo, Lovelock, Ford.
 43255. M. P. Depaoli, Wadsworth, Ford.
 43256. W. J. Ceresola, Wadsworth, Ford.
 43257. Vienna Ceresola, Wadsworth, Ford.
 43258. J. B. Sturla, Wadsworth, Ford.
 43259. S. Lee Joslin, M.D., Nixon, Buick.
 43260. Louis Tognini, Carson City, Buick.
 43261. Union Land & Cattle Co., Reno, Buick.
 43262. Union Land & Cattle Co., Reno, Dodge.
 43263. W. H. Doyle, Reno, Nash.
 43264. Thos. J. Hughes, Thompson, Hudson.
 43265. Rob Roy, Carson City, Chevrolet.
 43266. Ed. Lappat, Rand, Chevrolet.
 43267. Standard Oil Co., Tonopah, Ford.
 43268. A. H. Middleton, Stillwater, Cadillac.
 43269. Mrs. Geo. Townsend, Goldfield, Cadillac.
 43270. Stacy Taylor, Reno, Ford.
 43271. H. E. McLain, Goldfield, Dodge.
 43272. J. C. Hammer, McGill, Ford.
 43273. E. C. Thompson, Reno, Dodge.
 43274. C. J. Christensen, Sparks, Overland.
 43275. S. Christensen, Sparks, Ford.
 43276. G. W. Davis, Sparks, Studebaker.

- 43277...J. F. Williams, Sparks, Oakland.
 43278...Park Wheeler, Stillwater, Buick.
 43279...Otto Olsen, Reno, Dodge.
 43280...Tony A. Casazza, Reno, Buick.
 43281...George L. Ferris, Reno, Ford.
 43282...George L. Ferris, Reno, Hupmobile.
 43283...Jos. M. Keir, Reno, Ford.
 43284...C. M. Doty, Moapa, Ford.
 43285...Henry M. Lillis, Las Vegas, Ford.
 43286...C. H. Duborg, Reno, Chalmers.
 43287...Wm. R. Adams, Genoa, Mitchell.
 43288...Mrs. A. Degrossellier, Carson, Buick.
 43289...A. Gianni, Dayton, Ford.
 43290...Sam Lee, Carson, Ford.
 43291...Clyde A. Garrett, Carson, Ford.
 43292...Willis Smith, Yerington, Ford.
 43293...H. H. Banta, Reno, Ford.
 43294...J. B. Law, Verdi, Chevrolet.
 43295...V. Fulkerson, Fallon, Ford.
 43296...T. C. Goemmerker, Carson, Maxwell.
 43297...State Sheep Commission, Reno, Dodge.
 43298...J. P. Dickey, Yerington, Chevrolet.
 43299...W. H. Gibson, Minden, Chevrolet.
 43300...Tony Maionchi, Wichman, Oakland.
 43301...Byron Gates, Dayton, Ford.
 43302...S. E. Allen, Fallon, Chevrolet.
 43303...David Murphy, Tonopah, Apperson.
 43304...Dan Murnane, Tonopah, Dodge.
 43305...Dan Heineman, Tonopah, Ford.
 43306...J. C. Tognoni, Duckwater, Ford.
 43307...Fred M. Hansen, Tonopah, Ford.
 43308...Tonopah Elec. & T. Co., Tonopah, Chev.
 43309...Carl Sather, Reno, Oldsmobile.
 43310...W. J. Machabee, Reno, Maxwell.
 43311...Gray, Reid Wright Co., Reno, Overland.
 43312...Robert M. Price, Reno, Franklin.
 43313...Mrs. Beulah Wheeler, Reno, Liberty.
 43314...Miss Anna Johnson, Fallon, Ford.
 43315...Hugh T. Bennett, Ely, Ford.
 43316...J. D. Wallace, Ely, Ford.
 43317...H. H. Springmeyer, Minden, Ford.
 43318...Frank Ydiando, Golconda, Ford.
 43319...Frank Ydiando, Golconda, Overland.
 43320...Chas. M. Addis, Roop, Ford.
 43321...E. R. Bailey, Roop, Chevrolet.
 43322...Jos. B. Ferretta, Reno, Mitchell.
 43323...Adolph G. Hupfel, Reno, Studebaker.
 43324...T. W. Clark, Fallon, Ford.
 43325...A. E. Cartledge, Kimberly, Chandler.
 43326...Union Land & Cattle Co., Deeth, Buick.
 43327...Union Land & Cattle Co., Deeth, Dodge.
 43328...Union Land & Cattle Co., Deeth, Ford.
 43329...R. L. McBain, Las Vegas, Ford.
 43330...Frank W. Wallace, Las Vegas, Velle.
 43331...Samuel Shaw, Jr., Las Vegas, Oakland.
 43332...Pahrump Valley Co., Pahrump, Ford.
 43333...Pahrump Valley Co., Pahrump, Ford.
 43334...Pahrump Valley Co., Pahrump, Ford.
 43335...Mostolotta & Brother, Reno, Oldsmobile.
 43336...Paul Hours, McGill, Vim.
 43337...Ollie Searing, Ely, Maxwell.
 43338...J. L. Whipple, Sunnyside, Ford.
 43339...F. F. Owens, Ely, Dodge.
 43340...Alex Kolchek, Ely, Ford.
 43341...Allen H. Crowder, Ruth, Ford.
 43342...W. B. Colwell, Ely, Reo.
 43343...E. W. Jackson, Ely, Ford.
 43344...A. J. Proctor, Ely, Dodge.
 43345...Jack Maddaford, Ely, Ford.
 43346...M. Delich, Ely, Elcar.
 43347...Adams McGill Co., Ely, Ford.
 43348...L. M. House, East Ely, Chandler.
 43349...Geo. H. Ryan, Ely, Ford.
 43350...Frank L. Sellstrom, Pioche, Duplex.
 43351...F. S. Talcott, Imlay, Ford.
 43352...C. & L. Arabio, Lovelock, Reo.
 43353...John Minetto, Wadsworth, Ford.
 43354...Garaventa S. Co., Wadsworth, Ford.
 43355...Garaventa S. Co., Wadsworth, Ford.
 43356...Myles M. Wandling, Tonopah, Ford.
 43357...Arthur Cox, Tonopah, Chalmers.
 43358...John A. Erickson, Tonopah, Studebaker.
 43359...J. S. Bryan, Reno, Maxwell.
 43360...W. R. Hays, Round Mtn., Studebaker.
 43361...W. E. Allen, Goodsprings, Ford.
 43362...Paul Baugh, Battle Mtn., Buick.
 43363...Conklin Bros., Las Vegas, Haynes.
 43364...C. P. Adams, Battle Mtn., Dodge.
 43365...A. E. Springer, Fallon, Dodge.
 43366...C. M. Burr, Carson City, Saxon.
 43367...Ernest Warr, Fallon, Ford.
 43368...W. & L. Co., Winnemucca, Dodge.
 43369...C. H. Baker, Lovelock, Ford.
 43370...Henry Peters, Lovelock, Ford.
 43371...D. E. Hudgins, Unionville, Oakland.
 43372...I. E. Wells, Fallon, Ford.
 43373...H. E. Roe, Fallon, Dodge.
 43374...C. I. Graves, Fallon, Ford.
 43375...John C. Bray, Fallon, Ford.
 43376...Ed. T. Morgan, Northam, Chevrolet.
 43377...Jack Kington, Northam, Chevrolet.
 43378...Reuben Whipple, Overton, Ford.
 43379...F. W. Fall, Mina, Auburn Beauty.
 43380...Adams & Miller Co., Mina, Ford.
 43381...F. B. House, Hawthorne, Buick.
 43382...E. V. Miller, Mina, Haynes.
 43383...John McNeil, Mina, Dodge.
 43384...Eugene Segale, Virginia, Ford.
 43385...James Cuyler, Nixon, Ford.
 43386...J. R. Fulton, Reno, Ford.
 43387...James Snider, Tonopah, Ford.
 43388...S. R. Moore, Tonopah, Dodge.
 43389...Geo. Rhodes, Mina, Ford.
 43390...Harry Timms, Mina, Buick.
 43391...A. C. Daniel, Reno, Ford.
 43392...East Meat Market, Reno, Ford.
 43393...T. W. Martinez, Reno, Ford.
 43394...C. Maracci, Reno, Ford.
 43395...R. Manfacci, Reno, Ford.
 43396...F. E. Smith, Beatty, Ford.
 43397...Mark L. Yori, Reno, Oldsmobile.
 43398...C. W. Pickering, Reno, Maxwell.
 43399...Edward J. McManus, Reno, Chandler.
 43400...Donnell C. Willson, Reno, Ford.
 43401...Albert Kiezke, Reno, Buick.
 43402...A. J. McCauley, Imlay, Ford.
 43403...Adam Fife, Reno, White.
 43404...Reno Taxi, Reno, Hudson 6.
 43405...E. G. Cotter, Reno, Overland.
 43406...J. M. Higgins, Reno, Studebaker.
 43407...W. J. Woodward, Fallon, Oldsmobile.
 43408...Alton E. Buys, Goodsprings, Ford.
 43409...Fred Panelli, Yerington, Buick.
 43410...Frank Rassaschi, Yerington, Dodge.
 43411...Nev. Construction Co., Fallon, Hollier.
 43412...A. J. Webster, Reno, Ford.
 43413...Benj. J. Henley, Reno, Haynes.
 43414...Conant Bros., Inc., Reno, Ford.
 43415...F. A. Riordan, Lund, Ford.
 43416...W. A. See, Ely, Overland.
 43417...A. C. Lindsok, Ely, Buick.
 43418...M. L. Douglas, Ely, Ford.
 43419...R. A. Yelland, Aurum, Dodge.
 43420...C. T. McAuley, Ely, Ford.
 43421...Pres. Bd. S. S. Work, Ely, Ford.
 43422...Wm. Antonia, Ely, Buick.
 43423...Bert Webb, East Ely, Dodge.
 43424...Frangulis & Deskus, Ely, Chandler.
 43425...Peter Anderson, Hamilton, Dodge.
 43426...A. B. Bonham, East Ely, Dodge.
 43427...McGill Laundry, McGill, Ford.
 43428...E. F. Schultz, Ely, Overland.
 43429...Chas. Burke, Ely, Chandler.
 43430...L. K. Miller, Ely, Dodge.
 43431...Dick Winkleman, Genoa, Case.
 43432...Ely Securities Co., East Ely, Hupmo.
 43433...M. E. Davis, Fallon, Chevrolet.
 43434...French Cleaners, Reno, Ford.
 43435...Fred Stanley, Vya, Ford.
 43436...David Zeisler, Reno, Buick.
 43437...Max Wohlberg, Reno, Buick.
 43438...Conant Bros., Inc., Reno, Ford.
 43439...A. C. Jones, Ely, Ford.
 43440...S. Cliff & Sons, Franktown, Overland.
 43441...H. H. Bailey, Reno, Ford.
 43442...R. D. Johnson, Dayton, Ford.
 43443...M. Quillec & Sons, Dayton, Ford.
 43444...Carson River M. Co., Dayton, Overland.
 43445...Carson River M. Co., Dayton, Morind.
 43446...C. C. Tidd, Smith, Reo.
 43447...Robert Tidd, Smith, Ford.
 43448...A. C. Gouder, Wellington, Reo.
 43449...J. R. Beansage, Wellington, Buick.
 43450...Ely L. & P. Co., East Ely, Ford.

43451. Ely Water Co., East Ely, Ford.
 43452. Adams & McGill, Ely, Duplex.
 43453. F. C. Heise, Gardnerville, Overland.
 43454. Geo. G. Hussman, Gardnerville, Chlms.
 43455. J. A. Detting, Gardnerville, Hudson.
 43456. Sidney Dack, Gardnerville, Ford.
 43457. H. R. Mack, Minden, Chevrolet.
 43458. James Gallagher, Minden, Ford.
 43459. M. Irraras, Gardnerville, Overland.
 43460. Santo Ricardo, Yerington, Overland.
 43461. H. F. Kalkbermer, Tonopah, Ford.
 43462. Oscar Wickberg, McGill, Ford.
 43463. Chas. A. McLeod, Yerington, Buick.
 43464. F. Lathrop, Beatty, Ford.
 43465. Jim Nelson, Reno, Chandler.
 43466. Union Sheep Co., Reno, Buick.
 43467. J. A. Antrim, Lovelock, Ford.
 43468. F. A. Laws, Tonopah, Dodge.
 43469. Utah-Ne. L. & C. Co., Atlanta, White.
 43470. Utah-Ne. L. & C. Co., Atlanta, Ford.
 43471. Divide Annex M. Co., Tonopah, Ford.
 43472. Silver Divide M. Co., Tonopah, Ford.
 43473. Monarch P. M. Co., Tonopah, Ford.
 43474. Brounger Divide M. Co., Tonopah, Ford.
 43475. Belcher Divide M. Co., Tonopah, Ford.
 43476. Tonopah Divide M. Co., Tonopah, Ford.
 43477. Tonopah Divide M. Co., Tonopah, Fed.
 43478. Frank H. Schafer, Cherry Creek, Max.
 43479. Albin Bellander, Baker, Studebaker.
 43480. Nev. Packd. M. Co., L. Rochester, Ford.
 43481. Nev. Packd. M. Co., L. Rochester, Ford.
 43482. Pete Ondars, Elko, Haynes.
 43483. J. H. Johnston, Fallon, Ford.
 43484. James McEntee, Bruner, Ford.
 43485. Joe Yama, Wabuska, Dodge.
 43486. Mrs. E. Fenili, Yerington, Buick.
 43487. E. E. Edwards, Reno, Ford.
 43488. Lincoln Manning, Reno, Ford.
 43489. M. Aronson, Reno, Ford.
 43490. Frankie DeLay, Reno, Packard.
 43491. J. H. Minnick, Tonopah, Hup.
 43492. Caine & Morris, Tonopah, Dodge.
 43493. Ralph Duncan, Tonopah, Ford.
 43494. Ina Lee Morehouse, Fallon, Oldsmo.
 43495. J. S. Gray, Fallon, Ford.
 43496. F. P. Steinbrook, Fallon, Ford.
 43497. M. J. Curtis, Reno, Dodge.
 43498. C. H. Rand, Palisade, Ford.
 43499. Jos. Flynn, Jr., Romano, Ford.
 43500. R. G. Musgrave, Fallon, Chevrolet.
 43501. James Davis, Fallon, Ford.
 43502. G. F. Moore, Fallon, Ford.
 43503. J. C. Ferretto, Reno, Reo.
 43504. L. A. L. Green, Reno, Reo.
 43505. Caesar A. Ramelli, Reno, Chevrolet.
 43506. F. Serpentine, Reno, Reo.
 43507. V. M. Morrison, Fallon, Pullman.
 43508. F. W. Dudley, Fallon, Dort.
 43509. Mrs. W. P. Van Meter, Reno, Liberty.
 43510. J. N. Tedford, Fallon, Kissel.
 43511. J. N. Tedford, Fallon, Cadillac.
 43512. J. N. Tedford, Fallon, Ford.
 43513. J. Pincolini, Reno, Buick.
 43514. Mrs. G. H. Marven, Reno, Buick.
 43515. C. C. Smith, Reno, Chevrolet.
 43516. Washoe County Bank, Reno, Reo.
 43517. Arthur D. Smith, Reno, Marion.
 43518. C. F. Rose, Ruth, Buick.
 43519. Carl Stoddard, Reno, Ford.
 43520. Eugene Garavanta, Reno, Buick.
 43521. C. H. Lehnrs, Fallon, Hudson.
 43522. C. H. Lehnrs, Fallon, Hudson.
 43523. Ferretto Bros., Steamboat, Mitchell.
 43524. C. Wadsworth & Bros., Alamo, Ford.
 43525. C. Wadsworth & Bros., Alamo, Ford.
 43526. Edgar Sadler, Eureka, Ford.
 43527. Edgar Sadler, Eureka, Ford.
 43528. F. L. Summerfield, Mina, Oakland.
 43529. E. G. Springer, Fallon, Ford.
 43530. John H. Conaway, Caliente, Ford.
 43531. Mrs. M. L. Yori, Reno, Oldsmobile.
 43532. Novacovich Merc. Co., Reno, Ford.
 43533. Jean Rovetti, Reno, Ford.
 43534. Emmett K. Hull, Las Vegas, Ford.
 43535. Nick Karras, McGill, Chandler.
 43536. James Palmer, Jenn, Ford.
 43537. J. H. Gallagher, Ely, Denby.
 43538. Owen Halpin, Las Vegas, Ford.
 43539. Jno. P. Ferretta, Reno, Mitchell.
 43540. Commercial Soap Co., Reno, Dodge.
 43541. Geo. Willott, Reno, Ford.
 43542. Jas. G. Peckham, Reno, Ford.
 43543. Geo. C. Brodgar, Reno, Chevrolet.
 43544. Matteo Ramelli, Reno, Buick.
 43545. E. Manuel Moriconi, Simpson, Ford.
 43546. H. P. Boardman, Reno, Hupmobile.
 43547. Arthur J. Staricha, Gold Hill, Buick.
 43548. E. W. Lehmann, Ludwig, Maxwell.
 43549. R. L. Hobbit, Artesia, Buick.
 43550. Earl W. Hart, Reno, Chalmers.
 43551. J. F. Fredericks, Sweetwater, Reo.
 43552. J. F. Fredericks, Sweetwater, Ford.
 43553. Fred Bartine, Eureka, Ford.
 43554. Fred Bartine, Eureka, Dodge.
 43555. Fred Bartine, Eureka, Ford.
 43556. Geo. Hildebrand, Eureka, Ford.
 43557. Dan Kelley, Eureka, Ford.
 43558. James Morrison, Eureka, Dodge.
 43559. John Ardans, Eureka, Dodge.
 43560. T. J. Lalley, Eureka, Ford.
 43561. Kelley & Rebaleati, Eureka, Ford.
 43562. R. M. Tubbs, Death Valley, Ford.
 43563. J. R. Pierce, Manhattan, Ford.
 43564. Chas. Keough, Manhattan, Ford.
 43565. Chas. Keough, Manhattan, Ford.
 43566. C. A. Minoletti, Eureka, Hewitt Lud.
 43567. Ed. Morse, Eureka, Ford.
 43568. Mrs. M. Eccles, Romano, Ford.
 43569. Henry C. Neilson, Steamboat, Metz.
 43570. Jas. C. McKay, Tonopah, Cadillac.
 43571. Byron Millner, Reno, Ford.
 43572. Fred T. Newport, Searchlight, Ford.
 43573. Albert Schnitzer, Virginia, Reo.
 43574. J. Bradford, Sr., Death Valley, Ovrd.
 43575. J. Bradford, Jr., Death Valley, Ford.
 43576. Webster Mines Corp., Ione, Dodge.
 43577. J. W. McDonald, Lovelock, Buick.
 43578. H. H. Nutting, Sparks, Republic.
 43579. Sarah Plummer, Palisade, Ford.
 43580. Tony Semenza, Sparks, Ford.
 43581. Tony Semenza, Sparks, Dodge.
 43582. Cameron & Hart, Belmont, Dodge.
 43583. W. J. Darley, Mason, Chevrolet.
 43584. Geo. F. Thompson, Mina, Reo.
 43585. A. S. Olds, Fallon, Buick.
 43586. Pincolini Bros., Reno, Overland.
 43587. Dr. Hamer, Carson City, Overland.
 43588. W. L. Semenza, Reno, Overland.
 43589. M. O. Iverson, Golconda, Ford.
 43590. G. C. Hill, Verdi, Overland.
 43591. E. G. Norton, Fallon, Hollier.
 43592. E. G. Norton, Fallon, Hollier.
 43593. E. G. Norton, Fallon, Maxwell.
 43594. John P. Boland, Reno, Ford.
 43595. Henry Quill, Carson City, Buick.
 43596. F. M. Buol, Pahrump, Ford.
 43597. Pierce Evans, Reno, Reo.
 43598. W. J. Webster, Reno, Ford.
 43599. D. F. Lund, Reno, Oakland.
 43600. Jake Wainwright, Reno, Cadillac.
 43601. B. F. Morrow, Reno, Ford.
 43602. Monitor L. & C. Co., Belmont, Hup.
 43603. John DuPratt, Tonopah, Dodge.
 43604. W. E. Shostedt, Goodsprings, Knox.
 43605. W. E. Shostedt, Goodsprings, Packard.
 43606. W. E. Shostedt, Goodsprings, Ford.
 43607. Eugene Johnson, Eureka, Ford.
 43608. A. H. Campbell, Ely, Paige.
 43609. C. A. Chapman, Ludwig, Willys-K.
 43610. Joe York, Fallon, Ford.
 43611. Wm. H. Rogers, Las Vegas, Chevrolet.
 43612. City of Fallon, Fallon, Brockway-Amer.
 43613. City of Fallon, Fallon, Ford.
 43614. Argentine Div. M. Co., Tonopah, Reo 6.
 43615. Tognini Bros., Hobson, Oldsmobile.
 43616. Tognini Bros., Hobson, Buick.
 43617. Francis P. Temple, Las Vegas, Dodge.
 43618. Horace Greeley, Schurz, Overland.
 43619. E. F. Foltz, Schurz, Dodge.
 43620. Humboldt T. M. Co., Lovelock, Buick.
 43621. B. Y. Tomiyasan, Las Vegas, Ford.
 43622. J. J. Silk, Las Vegas, Dodge.
 43623. F. W. Weber, Overton, Stoddard-Day.
 43624. H. E. Nixon, Jarbidge, Ford.

- 43625...George A. Perrier, Ely, Saxon 6.
 43626...W. J. Wheeler, Elko, Ford.
 43627...James L. Filbey, Las Vegas, Ford.
 43628...W. H. McPhail, Lovelock, Oakland.
 43629...C. M. Beeghly, Fallon, Ford.
 43630...Della McGriff, Las Vegas, Ford.
 43631...Doug. Renfro Land Co., Fallon, Buick.
 43632...J. S. Wisner, Las Vegas, Ford.
 43633...James Sutcliffe, Pyramid, Dodge.
 43634...Fred R. Bannard, Ely, Franklin.
 43635...Fred R. Bannard, Ely, Republic.
 43636...E. J. Luce, McGill, Briscoe.
 43637...E. V. Hatch, Goldfield, Ford.
 43638...J. C. Guenet, Tonopah, Cadillac.
 43639...M. G. Myrtle, Goldfield, Ford.
 43640...Robert Ulass, Tonopah, Buick.
 43641...B. E. Thomas, Goldfield, Ford.
 43642...J. E. Shields, Goldfield, Ford.
 43643...L. T. Kendrick, Fallon, Dodge.
 43644...I. H. Kent Co., Fallon, Ford.
 43645...I. H. Kent Company, Fallon, Ford.
 43646...I. H. Kent Company, Fallon, P-Arrow.
 43647...I. H. Kent, Fallon, Pierce Arrow.
 43648...I. H. Kent Company, Fallon, Chevrolet.
 43649...I. H. Kent Co., Fallon, Chevrolet.
 43650...I. H. Kent Company, Fallon, Chevrolet.
 43651...I. H. Kent Company, Fallon, Ford.
 43652...Wm. Thran, Minden, Ford.
 43653...R. H. Cowles, Reno, Buick.
 43654...Al. Mills, Goldfield, Ford.
 43655...G. G. Allen, Ruth, Ford.
 43656...Edw. Johns, McGill, Ford.
 43657...R. C. Lamb, Goldfield, Ford.
 43658...R. C. Lamb, Goldfield, Oakland.
 43659...University of Nevada, Reno, Dodge.
 43660...C. H. Gorman, Reno, Dodge.
 43661...Ed. McFaul, Genoa, Ford.
 43662...J. W. Ferguson, Fallon, Dodge.
 43663...Hass Bros., Reno, Buick.
 43664...J. R. Lean, Virginia, Oakland.
 43665...D. R. Hancock, Virginia, Ford.
 43666...W. G. Sutherland, Lyon, Ford.
 43667...Wat Williams, Mason, Ford.
 43668...V. S. Grafton, Mason, Ford.
 43669...Henry Kremmel, Yerington, Ford.
 43670...Martin O'Malley, Virginia, Ford.
 43671...Amilio Fiori, Reno, Chevrolet.
 43672...Mrs. Clara Pearce, Reno, Hupmobile.
 43673...B. F. Bogart, Reno, Ford.
 43674...L. B. Norton, Reno, Reo.
 43675...Jack Thurm, Reno, Overland.
 43676...Ramon Inchausti, Wellington, Buick.
 43677...Joe Quilici, Simpson, Maxwell.
 43678...Ben Richardson, Tonopah, Maxwell.
 43679...Joe Cook, Tonopah, Denby.
 43680...Ginocchio Bros., Reno, Federal.
 43681...L. J. Ginocchio, Reno, Federal.
 43682...J. S. Ginocchio, Reno, Federal.
 43683...H. R. Cooke, Tonopah, Oldsmobile.
 43684...P. J. Bratley, Ash Meadows, Ford.
 43685...W. E. Harris, Reno, Franklin.
 43686...Fred Voight, Lamolille, Oldsmobile.
 43687...Ralph T. Smith, Verdi, Dodge.
 43688...H. H. McCarthy, Reno, Ford.
 43689...Elmer Burt, Goldfield, Overland.
 43690...Pearl R. Steele, Reno, Overland.
 43691...Bob Jones, Reno, Ford.
 43692...Geo. H. Anderson, Tonopah, Ford.
 43693...Joe Clifford, Tonopah, Case.
 43694...John E. Worden, Elko, Chevrolet.
 43695...Sunbeam Div. M. Co., Tonopah, Buick.
 43696...Mrs. Neubeaumer, Round Mtn., Ford.
 43697...Nevada Douglas C. Co., Ludwig, Ford.
 43698...H. G. Valteau, Reno, Studebaker.
 43699...John Mendoza, Tonopah, Ford.
 43700...John G. Lucich, Tonopah, Ford.
 43701...C. D. Campbell, Reno, Ford.
 43702...C. D. Campbell, Reno, Mitchell.
 43703...Gray, Reid & Co., Fallon, Chevrolet.
 43704...Gray, Reid & Co., Fallon, Ford.
 43705...Gray, Reid & Co., Fallon, Ford.
 43706...Gray, Reid & Co., Fallon, Ford.
 43707...Gray, Reid & Co., Fallon, Oldsmobile.
 43708...S. J. Burns, Reno, Liberty.
 43709...V. Saibini, Verdi, Overland.
 43710...Nev.-Cal. Power Co., Goldfield, Ford.
 43711...Nev.-Cal. Power Co., Tonopah, Ford.
 43712...Nev.-Cal. Power Co., Tonopah, Giant.
 43713...Frank Wiggins, Lamolille, Chevrolet.
 43714...Nicklas M. Co., Battle Mountain, Ford.
 43715...W. F. Linebarger, Carlin, Ford.
 43716...Harry E. Webb, Palisade, Ford.
 43717...Martin Filippini, Beowawe, Overland.
 43718...Frank Eaton, Battle Mountain, Hup.
 43719...J. F. Hoosey, Ryland, Metz.
 43720...Mrs. C. O. Davies, Reno, Reo 6.
 43721...Pete Olabarria, Elko, Dodge.
 43722...Frank Fernald, Sr., Elko, Dodge.
 43723...D. E. Mitchell, Fernley, Ford.
 43724...H. L. Sanborn, Elko, Ford.
 43725...B. Lohiday & Co., Reno, Hudson.
 43726...B. Lohiday & Co., Reno, Ford.
 43727...J. S. Elstner, Reno, Ford.
 43728...R.-I.-F. Sausage Factory, Reno, Ford.
 43729...E. E. Jackman, Verdi, Ford.
 43730...Tom Hendryx, Reno, Ford.
 43731...H. Hanson, Verdi, Ford.
 43732...Nev. Mach. & Elec. Co., Reno, Ford.
 43733...Thos. Gordon, Reno, Ford.
 43734...J. S. Mann, Smith, Buick.
 43735...E. W. Scott, Smith, Ford.
 43736...G. O. McVicar, Smith, Hupmobile.
 43737...Steve Pedrol, Franktown, Chalmers.
 43738...Highland Cattle Co., Beowawe, Chev.
 43739...Samuel W. Belford, Reno, Hudson.
 43740...George S. Brown, Reno, Hudson.
 43741...Thomas Johnson, Reno, Ford.
 43742...C. H. Swart, Reno, Overland.
 43743...I. E. Cook, Reno, Reo.
 43744...A. Graham, Reno, Scripps-Booth.
 43745...Tom Wilkef, Gardnerville, Case.
 43746...Al. L. Bailey, Washoe, Pope Hartford.
 43747...F. J. Sauer, Washoe, Ford.
 43748...Mrs. Roy Johnstone, Divide City, Ford.
 43749...C. H. Green, Cherry Creek, Ford.
 43750...C. F. Whipple, Tecoma, Oakland.
 43751...J. P. Ingle, Las Vegas, Maxwell.
 43752...R. C. Browning, Tecoma, Overland.
 43753...Starr W. Hill, Lovelock, Oakland.
 43754...Starr W. Hill, Lovelock, Ford.
 43755...G. A. Ackley, Wadsworth, Ford.
 43756...Oliver Ahlers, Fernley, Ford.
 43757...Chas. H. Burd, Fernley, Dodge.
 43758...A. Pardini, Hazen, Dort.
 43759...James A. Jensen, Lovelock, Ford.
 43760...Cooper & Uniacke, Lovelock, Ford.
 43761...M. W. Burke, Lovelock, Overland.
 43762...Mrs. J. Etchart, Golconda, Overland.
 43763...John Etchart, Golconda, Dodge.
 43764...L. Grebenc, Golconda, Dodge.
 43765...M. Lewis, Reno, Ford.
 43766...W. L. Kistler, Sparks, Chevrolet.
 43767...W. L. Kistler, Sparks, Ford.
 43768...Lewis Bros., Reno, Ford.
 43769...M. L. Achey, Sparks, Ford.
 43770...M. A. Laking, Sparks, Overland.
 43771...John P. Williams, Derby, Overland.
 43772...John P. Williams, Derby, Chandler.
 43773...F. C. Savage, Reno, Ford.
 43774...William P. Seeds, Reno, Studebaker.
 43775...Gertrude Vance, Reno, Dodge.
 43776...National Cash Market, Reno, Ford.
 43777...National Cash Market, Reno, Ford.
 43778...W. E. Kornmayer, Reno, Haynes.
 43779...Sarah Chase, Reno, Studebaker.
 43780...Geo. I. James, Reno, Ford.
 43781...Carl Lundberg, Sparks, Ford.
 43782...H. S. Morgan, Wichman, Dodge.
 43783...L. W. Osborn, Yerington, Marlon.
 43784...J. D. Luzior, Yerington, Chevrolet.
 43785...Wm Scossa, Mason, Overland.
 43786...Claude E. Lamb, Luning, Ford.
 43787...Ernest Rockliff, Luning, Ralston.
 43788...T. R. Pledge, Luning, Kissel Kar.
 43789...Nevada Natl. Ice Co., Tonopah, Ford.
 43790...Nevada Natl. Ice Co., Tonopah, Fed.
 43791...W. V. Richardson, Tonopah, Chandler.
 43792...Nevada Natl. Ice Co., Reno, Ford.
 43793...Nevada Natl. Ice Co., Las Vegas, Rep.
 43794...John Falwick, Dyer, Ford.
 43795...Fred Fletcher, Dyer, Studebaker.
 43796...Fred Fletcher, Dyer, Studebaker.
 43797...Ben Mosbek, Mina, Chalmers.
 43798...J. C. Ferrell, Fallon, Buick.

- 43799...J. C. Ferrell, Fallon, Ford.
 43800...A. M. Trolson, Fallon, Ford.
 43801...Julia N. Theo, Goldfield, Overland.
 43802...C. H. Phillips, Goldfield, Ford.
 43803...J. E. C. Williams, Goldfield, Ford.
 43804...A. H. Cooper, Goldfield, Ford.
 43805...Montezuma Sil. Mines, Goldfield, Ford.
 43806...F. F. Donnelly, Goldfield, Ford.
 43807...W. H. Moffat, Reno, Packard.
 43808...W. H. Moffat, Reno, Packard.
 43809...W. H. Moffat, Reno, Cadillac.
 43810...Mrs. Daisy Meyers, Reno, Buick.
 43811...Albert J. Franck, Reno, Cadillac.
 43812...C. T. Mullins, Reno, Cadillac.
 43813...J. L. McCarthy, Goldfield, Studebaker.
 43814...Roy Mitchell, Mound House, Ford.
 43815...E. E. Tailleux, Dayton, Ford.
 43816...Nev. Mine Op. Ass'n., Reno, Hudson.
 43817...R. J. Jefferson, Reno, Hudson.
 43818...Thomas A. Hamilton, Smith, Ford.
 43819...Plymouth L. & S. Co., Smith, Buick.
 43820...Myrtle L. Robear, Reno, Overland.
 43821...Chester Smith, Simpson, Ford.
 43822...August Bunkowski, Simpson, Ford.
 43823...J. Chris Jorgensen, Simpson, Ford.
 43824...W. E. Allen, Smith, Ford.
 43825...Hans Johnson, Minden, Overland.
 43826...T. S. Hook, Gardnerville, Hupmobile.
 43827...Herman Tholke, Gardnerville, Ford.
 43828...H. F. Dangberg, Minden, Ford.
 43829...H. F. Dangberg, Minden, Ford.
 43830...Geo. F. Dangberg, Minden, Lexington.
 43831...H. F. Dangberg, Minden, Cadillac.
 43832...J. B. Dangberg, Minden, Buick.
 43833...J. B. Dangberg, Minden, Buick.
 43834...H. F. Dangberg, Minden, Ford.
 43835...Henry Nedenriep, Gardnerville, Buick.
 43836...Robert Trimmer, Genoa, Ford.
 43837...H. C. Lampe, Gardnerville, Case.
 43838...M. V. Gilbert, Wellington, Buick.
 43839...Edward W. Mollart, Artesia, Chevrolet.
 43840...Warren Mollart, Artesia, Ford.
 43841...Carson V. H. & P. Co., Minden, Ford.
 43842...Wm. Lange, Gardnerville, Buick.
 43843...Dr. B. Brown, Yerington, Reo.
 43844...E. Dalsell, Yerington, Ford.
 43845...H. Hansen, Yerington, Studebaker.
 43846...A. Pardini, Yerington, Maxwell.
 43847...John Francis, Virginia City, Ford.
 43848...Henry N. Greenfield, Reno, Overland.
 43849...Fannie B. Patrick, Reno, Dodge.
 43850...E. W. Gray, Reno, Dodge.
 43851...C. M. Peck, Reno, Chevrolet.
 43852...J. P. Schopper, Reno, Ford.
 43853...M. E. Catterato, Reno, Paige.
 43854...H. C. Bath, Carson City, Chevrolet.
 43855...M. C. Garrett, Carson City, Ford.
 43856...Wood Curtis Co., Tonopah, Ford.
 43857...Otto A. Riffel, Tonopah, Ford.
 43858...Alma Earl, Kimberly, Ford.
 43859...W. H. Bishop, Ely, Chalmers.
 43860...Adams & Miller Co., Hawthorne, Ford.
 43861...William Muldoon, Hawthorne, Hupmo.
 43862...Phil Meyer, Millett, Dodge.
 43863...Jos. E. Connor, Manhattan, Studebkr.
 43864...J. H. Green, Jr., Lovelock, Ford.
 43865...C. B. Likes, Fallon, Ford.
 43866...H. C. Hanson, Mason, Overland.
 43867...Citizens L. & S. Co., Yerington, Buick.
 43868...Citizens L. & S. Co., Yerington, Reo.
 43869...Louis D. Norris, Tonopah, Ford.
 43870...John Gillan, Tonopah, Ford.
 43871...W. M. Ingram, Tonopah, Ford.
 43872...J. D. Wight, Tonopah, Dodge.
 43873...O. Nanini, Manhattan, Pope-Hartford.
 43874...Wm. Hunter, Elko, Oldsmobile.
 43875...Henry B. Voigts, Rebel Creek, Ford.
 43876...J. H. Mackay, Thompson, Buick.
 43877...Goldfield Dev. Co., Goldfield, Federal.
 43878...H. M. Towner, Las Vegas, Chevrolet.
 43879...Hans Olsen, Caliente, Chevrolet.
 43880...Chas. Catlin, Montello, Hudson.
 43881...Ed. Rotholz, Reno, Hudson.
 43882...Marie Martin, Reno, Oldsmobile.
 43883...Giulo Menesini, Yerington, Ford.
 43884...C. M. Allum, Yerington, Oakland.
 43885...T. J. Bell, Austin, Chandler
 43886...C. D. Terwilliger, Reno, Hudson.
 43887...F. E. Walker, Reno, Reo.
 43888...Otto Johnson, Manhattan, Ford.
 43889...C. T. Lawrence, Manhattan, Ford.
 43890...John B. Giordano, Manhattan, Chev.
 43891...Hugh W. Reelly, Yerington, Dodge.
 43892...Wm. Mallon, Yerington, Ford.
 43893...Elmer Hanson, Yerington, Dodge.
 43894...Harry F. Dolan, Yerington, Ford.
 43895...H. H. Steck, Yerington, Chevrolet.
 43896...West Hardware Co., Yerington, Ford.
 43897...West Hardware Co., Yerington, Intl.
 43898...E. A. West, Yerington, Ford.
 43899...J. C. Snyder, Yerington, Mitchell.
 43900...Round Mtn., M. Co., Rd. Mtn., Dodge.
 43901...Round Mtn. M. Co., Rd. Mtn., Dodge.
 43902...John Sanger, Carson City, Dodge.
 43903...H. Heidenreich, Franktown, Chalmers.
 43904...John Semenza, Reno, Ford.
 43905...John Semenza, Reno, Overland.
 43906...A. A. Graetz, Mason, Ford.
 43907...D. M. Shropshire, Winnemucca, Hup.
 43908...Carl Anderson, Carson City, Packard.
 43909...Mrs. S. G. Lamb, Winnemucca, Olds.
 43910...Ashdown G. M. Co., Denio, Or., Reo.
 43911...Wm. Rinehart, Vya, Dodge.
 43912...L. A. Friedman, Lovelock, Studebaker.
 43913...Nev. Gen. Metals Co., Lovelock, Reo.
 43914...Mrs. L. Rockwell, Battle Mtn., Ford.
 43915...Joseph Bruder, Goldfield, Lexington.
 43916...S. M. Wiley, Verdi, Ford.
 43917...Herman Weber, Goldfield, Ford.
 43918...Fred Davis, Bullion, Saxon.
 43919...Hans Westergard, Lovelock, Ford.
 43920...A. J. Maestretti, Austin, Ford.
 43921...J. F. Blanchard, Battle Mtn., Ford.
 43922...Willard Morgan, Battle Mtn., Ford.
 43923...J. W. Jones, Pyramid, Studebaker.
 43924...U. S. Indian Service, Moapa, Ford.
 43925...U. S. Indian Service, Moapa, Stude.
 43926...R. E. Chormicle, Arden, Overland.
 43927...Edward Wasserbach, Las Vegas, Buick.
 43928...J. S. Smith, Las Vegas, Dodge.
 43929...T. A. McNeil, Tonopah, Dodge.
 43930...Oliver Jensen, Tonopah, Ford.
 43931...Robert James Burger, Tonopah, Ford.
 43932...Mrs. M. Echols, Reno, Studebaker.
 43933...Mrs. G. B. Ritter, Reno, Studebaker.
 43934...L. D. Bryant, Reno, Ford Sedan.
 43935...Ralph S. Casey, Reno, Chevrolet.
 43936...Chism Ice Cream Co., Reno, Federal.
 43937...Chism Ice Cream Co., Reno, Ford.
 43938...E. W. Chism, Reno, Buick.
 43939...Chism Ice Cream Co., Reno, Ford.
 43940...Chism Ice Cream Co., Reno, Ford.
 43941...H. F. Alps, Reno, Dodge.
 43942...Peter Dady, Reno, Mitchell.
 43943...Mrs. J. L. Pecetti, Reno, Dodge.
 43944...H. F. Hagen, Reno, Ford.
 43945...R. L. Robinson, Reno, Buick.
 43946...Peter Motto, Reno, Monroe.
 43947...U. M. Slater, Inc., Reno, Ford.
 43948...J. R. Henninger, Yerington, Studebaker.
 43949...Silva Awesta, Reno, Essex.
 43950...Geo. Yori, Reno, Haynes.
 43951...J. Dell Acqua, Reno, Overland.
 43952...Pete Henrichs, Yerington, Ford.
 43953...D. Okomata, Yerington, Chevrolet.
 43954...E. Bergstrom, Yerington, Dodge.
 43955...Jay Perry, Yerington, Ford.
 43956...Mineva M. Co., Camp Terrell, Stude.
 43957...Alfred Doull, McGill, Dodge.
 43958...V. B. Terrell, Fallon, Dodge.
 43959...G. H. Mitchell, Fallon, Chevrolet.
 43960...Mrs. E. J. Robinson, Fallon, Overland.
 43961...C. F. Johnson, Fallon, Dodge.
 43962...A. D. Dunn, Fallon, Ford.
 43963...A. D. Dunn, Fallon, Chevrolet.
 43964...Charles S. Bailey, Fallon, Monroe.
 43965...Erva Alexander, Fallon, Ford.
 43966...Dave Carlson, Fallon, Chalmers.
 43967...C. H. Forsberg, Fallon, Dort.
 43968...J. H. Miller, Fallon, Overland.
 43969...F. E. Nicholas, M.D., Fallon, Chevrolet.
 43970...D. W. Lucas, Fallon, Ford.
 43971...E. Opdyke, Fallon, Ford.
 43972...Geo. Dalton, Fallon, Dodge.

- 43973....Crofut Bros, Birch, Ford.
 43974....J. J. Hanifan, Fallon, Ford.
 43975....G. E. Burton, Fallon, Overland.
 43976....T. C. Dula, Caliente, Ford.
 43977....Leo Schatzschneider, Fallon, Ford.
 43978....Lawrence Petrinovich, Reno, Buick.
 43979....J. F. Kleppe, Reno, Studebaker.
 43980....E. J. Kleppe, Reno, Ford.
 43981....Clarence Johnson, Eureka, Ford.
 43982....H. J. Rutherford, Deeth, Ford.
 43983....J. Wm. Raggio, Reno, Buick.
 43984....G. Wilkinson, Reno, Chevrolet.
 43985....S. L. Williams, Sparks, Reo.
 43986....John Gianutsos, Sparks, Ford.
 43987....George Dellasanti, Sparks, Buick.
 43988....P. E. Meehan, Sparks, Dodge.
 43989....F. A. King Drury Co., Sparks, Ford.
 43990....A. Trewick, Sparks, Overland.
 43991....N. B. Kyker, Sparks, Maxwell.
 43992....C. B. Hotaling, Sparks, Overland.
 43993....Reno Wal Paper Co., Reno, Ford.
 43994....J. L. Hash, Reno, Reo.
 43995....Dr. J. L. Robinson, Reno, Reo.
 43996....Sherman Clay Co., Reno, Ford.
 43997....L. L. Selva, Reno, Chevrolet.
 43998....Reno Meat Co., Reno, Ford.
 43999....W. H. Goodwin, Reno, Chalmers.
 44000....W. M. Ireland, Reno, Buick.
 44001....John S. Orr, Reno, Studebaker.
 44002....P. Walsh & Sons, Austin, Kissel Kar.
 44003....R. C. Johnston, Ione, Chase.
 44004....Mrs. J. R. Ingram, Austin, Oakland.
 44005....Potts Bros., Austin, Hudson.
 44006....Chas. C. Corkhill, Las Vegas, Dodge.
 44007....Potts Bros., Austin, Hudson.
 44008....Fred Etchegary, Austin, Ford.
 44009....Virginia Market, Reno, Ford.
 44010....Ashdown G. M. Co., Denio, Oreg., Reo.
 44011....R. E. Tilden, Winnemucca, Buick.
 44012....Louis W. Milner, Valmy, Chevrolet.
 44013....G. J. Reilly, Golconda, Ford.
 44014....J. D. Minor, Winnemucca, Buick.
 44015....J. A. Rogers, Winnemucca, Chevrolet.
 44016....E. P. Stites, Winnemucca, Ford.
 44017....M. Dangelmaier, Amos, Studebaker.
 44018....R. E. Montgomery, McDermitt, Buick.
 44019....J. A. Barngrover, Valmy, Ford.
 44020....Henry Frevert, Gardnerville, Dodge.
 44021....C. C. Turney, Winnemucca, Ford.
 44022....I. J. Studebaker, Rebel Creek, Ford.
 44023....F. J. Button, Winnemucca, Ford.
 44024....A. E. Bolam, Winnemucca, Ford.
 44025....I. Woolverton, Genoa, Ford.
 44026....A. Belmont, Stewart, Ford.
 44027....Quillici Bros., Dayton, Buick.
 44028....G. Teglia, Dayton, Oldsmobile.
 44029....Assunta Belmonte, Stewart, Ford.
 44030....Chas. C. Perry, Yerington, Ford.
 44031....Chas. C. Perry, Yerington, Ford.
 44032....Clyde Jackson, Tonopah, Ford.
 44033....E. Elliott, Elko, Chevrolet.
 44034....Amos Fabri, Yerington, Buick.
 44035....Fabri & Co, Yerington, Ford.
 44036....Fabri & Co., Yerington, Little Giant.
 44037....R. E. Everett, Yerington, Ford.
 44038....J. B. Gallagher, Yerington, Buick.
 44039....Vic Bernard, Yerington, Dodge.
 44040....J. H. Farrell, Wabuska, Ford.
 44041....Geo. W. Bull, Sheridan, Ford.
 44042....A. E. Metzker, Mason, Ford.
 44043....John H. Brooch, Verdi, Ford.
 44044....W. J. Douglas, Reno, Paige.
 44045....Mrs. L. L. Wheeler, Reno, Dodge.
 44046....Harry S. Conley, Reno, Chevrolet.
 44047....Mrs. A. C. Nelson, Reno, Ford.
 44048....Dr. Alex McIntyre, Reno, Hudson.
 44049....W. D. Lane, Carson City, Ford.
 44050....L. Mari, Fallon, Ford.
 44051....H. Dieterich, Reno, Studebaker.
 44052....Geo. Wilson, Reno, Maxwell.
 44053....W. P. Nysuaner, Reno, Ford.
 44054....J. H. Wigg, Reno, Ford.
 44055....Arthur E. Murchir, Sparks, Overland.
 44056....E. C. Smith, Reno, Franklin.
 44057....John J. Winters, Bruner, Ford.
 44058....W. F. Browder, Bruner, Ford.
 44059....Thos. V. Conner, Fallon, Ford.
 44060....J. T. Theyer, Fallon, Overland.
 44061....Fred Williams, Stillwater, Ford.
 44062....W. T. Moran, Virginia City, Chevrolet.
 44063....Domingo Cerfoglio, Huffaker, Stude.
 44064....Mrs James Boyd, Reno, Pilot.
 44065....V. A. Becasas, Reno, Ford.
 44066....Austin J. Nugent, Yerington, Ford.
 44067....Nevada Life Ins. Co., Reno, Oldsmobile.
 44068....Standard Metals Co., Reno, Chandler.
 44069....Standard Metals Co., Reno, Republic.
 44070....Standard Metals Co., Reno, Ford.
 44071....W. E. Paul, Fallon, Ford.
 44072....W. A. Harmon, Fallon, Hudson.
 44073....Howard Stevens, Fallon, Ford.
 44074....Fred Venth, Fallon, Maxwell.
 44075....W. S. Timblin, Reno, Buick.
 44076....Pete Pierini, Dayton, Mitchell.
 44077....J. M. Dority, Carson City, Ford.
 44078....T. W. Cross, Carson City, Ford.
 44079....C. D. Morden, Tybo, Ford.
 44080....Mrs. W. A. Reymers, Yerington, Buick.
 44081....C. E. Thrall, Reno, Reo.
 44082....S. W. Cain, Reno, Hudson.
 44083....J. S. Brayton, Goldfield, Ford.
 44084....A. L. Munroe, Reno, Buick.
 44085....Frank Swartz, Ely, Dodge.
 44086....L. G. Peterson, Ruth, Maxwell.
 44087....F. E. Grant, Ruth, Hudson.
 44088....Harlo Bates, Tippet, Ford.
 44089....C. Charbneau, Sparks, Reo.
 44090....A. E. Cheney, Reno, Dodge.
 44091....H. O. Werner, Reno, Reo.
 44092....Joe B. Siri, Luning, Ford.
 44093....Anna Meyer, Luning, Oldsmobile.
 44094....Succetti Bros., Luning, Saxon.
 44095....Arthur S. Putney, Manhattan, Ford.
 44096....S. Rota, Manhattan, Overland.
 44097....Allan Tallent, Manhattan, Ford.
 44098....Charlotte Milne, Thompson, Buick.
 44099....Monroe Egger, Tonopah, Dodge.
 44100....Cremor Erickson Co., Goldfield, Ford.
 44101....Ida Ryan, Searchlight, Studebaker.
 44102....Pete Lambert, Shellbourne, Chevrolet.
 44103....John Uhlana, Ely, Dodge.
 44104....Illipah Basin Oil Co., Ely, Essex.
 44105....Armond Reynolds, Ely, National.
 44106....Peter Espagna, Ely, Ford.
 44107....Geo. Earl, Kimberly, Oakland.
 44108....White Pine Tel. Co., Ely, Chevrolet.
 44109....E. M. Mastersen, Ruth, Ford.
 44110....John Berry, Ely, Ford.
 44111....N. E. Musick, Ruth, Chevrolet.
 44112....W. E. Watson, Ely, Studebaker.
 44113....Mrs. J. A. Seilacci, Lovelock, Chevrolet.
 44114....Albert Hankins, Jiggs, Oldsmobile.
 44115....Hankins Co., Jiggs, Kissel.
 44116....Albert Hankins, Jiggs, Franklin.
 44117....Glenn D. Cook, Oreana, Empire.
 44118....Noble-Smith Sheep Co., Elko, Chandler.
 44119....Pete Itcaina, Elko, Hudson.
 44120....Noble-Smith Sheep Co., Elko, Hudson.
 44121....B. F. Curler, Elko, Buick.
 44122....F. E. Durham, Verdi, Reo.
 44123....Tippett Merc. Co., Tippett, Buick.
 44124....Tippett Merc. Co., Tippett, Federal.
 44125....Jim Butler M. Co., Tonopah, Locomo.
 44126....Joseph Galiot, Thompson, Adams.
 44127....Joseph Galiot, Thompson, Pierce-Ar.
 44128....Joseph Galiot, Thompson, Velje.
 44129....Joseph Galiot, Thompson, Ford.
 44130....Joe Farrell, Wabuska, Ford.
 44131....Henry H. Lee, Panaca, Dodge.
 44132....Joe Salvetti, Fallon, Ford.
 44133....Andrew Tourrewill, Elko, Chandler.
 44134....F. M. Macy, Midas, Ford.
 44135....Oscar Berg, Midas, Buick.
 44136....Gunn Supply Co., Las Vegas, Ford.
 44137....Battle Mtn. & Hilltop Stage, Maxwell.
 44138....Dr. W. E. Welb, Battle Mtn., Buick.
 44139....Fritz Walti, Tonkin, Ford.
 44140....George Duborg, Beowawe, Ford.
 44141....J. A. Hansen, Wells, Ford.
 44142....W. H. Gibbs, Wells, Ford.
 44143....J. A. Ralph, Wells, Cole.
 44144....C. V. Cole, Pioche, Ford.
 44145....L. Burt, Caliente, Ford.
 44146....C. L. Alquist, Caliente, Elcar.

- 44147...Grant Walls, Jarbidge, Ford
 44148...Glover & Braider, Reno, Buick.
 44149...J. W. Wright, Reno, Franklin.
 44150...Mathias DeSouza, Reno, Ford.
 44151...Harry Kelly, Reno, Ford.
 44152...E. Canopa, Reno, Ford.
 44153...Thos. B. Laurie, Reno, Ford.
 44154...Tony Barboza, Reno, Ford.
 44155...Mrs. J. W. Knowles, Reno, Ford.
 44156...J. W. Haslam, Fallon, Chalmers.
 44157...R. C. Jensen, Reno, Pierce Arrow.
 44158...R. C. Jensen, Reno, Ford.
 44159...R. C. Jensen, Reno, Dodge.
 44160...Fred Sontina, Wabuska, Dodge.
 44161...Sallia & Ricci, Yerington, Overland.
 44162...G. E. Bates, Reno, Chevrolet.
 44163...W. M. Snare, Reno, Chevrolet.
 44164...J. W. Edwards, Reno, Reo.
 44165...S. L. Kovachevich, Reno, Chevrolet.
 44166...Oscar McNeil, Yerington, Ford.
 44167...City of Lovelock, Lovelock, Ford.
 44168...H. J. Fick, Hawthorne, Ford.
 44169...Wilson Divide M. Co., Tonopah, Ford.
 44170...E. L. Cushing, Reno, Dodge.
 44171...Ton. Dividend M. Co., Tonopah, Morind.
 44172...Ton. Dividend M. Co., Tonopah, Ford.
 44173...Ton. Dividend M. Co., Tonopah, Ford.
 44174...Mrs. Ira J. McKnight, Ely, Chevrolet.
 44175...August Winter, Ely, Ford.
 44176...A. J. Stevens, Ely, Buick.
 44177...J. E. Stevens, Ely, Studebaker.
 44178...Gus Halerau, Fallon, Oldsmobile.
 44179...G. W. Winder, Fallon, Chevrolet.
 44180...Peerless Oil Co., Fallon, Ford.
 44181...E. L. Winder, Fallon, Case.
 44182...Wm. Powell, Fallon, Oakland.
 44183...Paris Pearau, Fallon, Chevrolet.
 44184...Thos. Hawthorne, Fallon, Chevrolet.
 44185...J. C. Laird, Fallon, Chevrolet.
 44186...W. H. Pierson, Fallon, Ford.
 44187...Jones & Jewell, Fallon, Overland.
 44188...Wm. Kiernan, Reno, Ford.
 44189...J. F. Ryan, Searchlight, Studebaker.
 44190...E. K. Perkins, Searchlight, Ford.
 44191...Ben L. Peters, Nelson, Hupmobile.
 44192...H. R. Cashman, Searchlight, Hupmobile.
 44193...Wm. Kerwin, Searchlight, Buick.
 44194...Joe Zorman, Tonopah, Chevrolet.
 44195...Fred E. Schultz, Goldfield, Ford.
 44196...Geo. A. Smith, Goldfield, Buick.
 44197...Giles P. Hard, Tonopah, Ford.
 44198...Amos Brown, Goldfield, Ford.
 44199...J. P. Matthews, Goldfield, Ford.
 44200...H. H. Roberson, Carrara, Ford.
 44201...Jim Hawkins, Genoa, Ford.
 44202...Herman Erdst, Genoa, Dodge.
 44203...Lander Gyrofi, Round Mtn., Dodge.
 44204...Mrs. R. A. Burrows, Reno, Dodge.
 44205...E. J. Caffery, Reno, Ford.
 44206...Carson Hot Springs, Carson, Ford.
 44207...Carson Hot Springs, Carson, Ford.
 44208...Louis Pierotti, Reno, Studebaker.
 44209...Hill Bros., Goldfield, Moreland.
 44210...Smith & Calhoun, Tonopah, Hupmobile.
 44211...Charles O. Taggs, Goldfield, Overland.
 44212...Bert Laws, Yerington, Reo.
 44213...Ed. Kuster, Yerington, Studebaker.
 44214...Patrick Morgan, Reno, Reo.
 44215...S. H. Brady, Reno, Franklin.
 44216...S. H. Brady, Reno, Reo.
 44217...Wm. Wise, Carson City, Chevrolet.
 44218...Steve Lockett, Reno, Ford.
 44219...A. Jensen, Gardnerville, Candler.
 44220...Oliver Swanson, Gardnerville, Ford.
 44221...F. Springmeyer, Gardnerville, Chand.
 44222...F. Springmeyer, Gardnerville, Ford.
 44223...Wm. Dangberg, Minden, Monroe.
 44224...Ernest Bartels, Minden, Buick.
 44225...P. Erstarbe, Gardnerville, Maxwell.
 44226...J. H. Stodick, Gardnerville, Lexington.
 44227...Henry Ahlden, Minden, Chevrolet.
 44228...F. C. Neddenriep, Minden, Buick.
 44229...M. Hansen, Gardnerville, Ford.
 44230...M. Hansen, Gardnerville, Overland.
 44231...H. F. Dangberg, Minden, Cadillac.
 44232...H. F. Dangberg, Minden, Dorris.
 44233...Howard & Jones, Gardnerville, Overland.
 44234...Peter Irrebarne, Gardnerville, Buick.
 44235...Erna Godecke, Gardnerville, Chevrolet.
 44236...Henry Godecke, Gardnerville, Buick.
 44237...Godecke Bros., Gardnerville, Ford.
 44238...John Christensen, Gardnerville, Dodge.
 44239...Walter Frey, Gardnerville, Overland.
 44240...Walter Frey, Gardnerville, Ford.
 44241...Norman Ellas, Minden, Ford.
 44242...O. O. Haugner, Gardnerville, Ford.
 44243...Geo. Heitman, Gardnerville, Dodge.
 44244...E. B. Yerington, Carson City, Buick.
 44245...A. Jensen, Gardnerville, Ford.
 44246...Deitrich Theis, Yerington, Overland.
 44247...Heitman & Theis, Yerington, Chevrolet.
 44248...A. S. Phipps, Yerington, Reo.
 44249...Alfred DuBois, Virginia, Chevrolet.
 44250...Mrs. L. Stevens, Yerington, Ford.
 44251...Mrs. L. Stevens, Yerington, Hupmo.
 44252...Tony Menegatti, Yerington, Dodge.
 44253...Geo. H. Beers, Yerington, Pullman.
 44254...John Pasheco, Smith, Ford.
 44255...Clifford Cooper, Smith, Chevrolet.
 44256...Rose Young, Sparks, Buick.
 44257...Clara D. Lewis, Reno, Oakland.
 44258...C. H. Norcross, Reno, Buick.
 44259...Fred D. Fox, Verdi, Ford.
 44260...Walt Bros., Reno, Ford.
 44261...Walt Bros., Reno, Ford.
 44262...Walt Bros., Reno, Ford.
 44263...Dept. of Highways, Carson, Packard.
 44264...Diamond Oil Co., Fallon, Ford.
 44265...Peyser & Eckhoff, Reno, Ford.
 44266...Peyser & Eckhoff, Reno, Chevrolet.
 44267...Lee Bell, Tonopah, Overland.
 44268...John Manson, Current, Ford.
 44269...J. P. Marsh, Elko, Hudson.
 44270...L. L. Wedertz, Wellington, Reo.
 44271...Ed. J. Walsh, Carson City, Ford.
 44272...Leo Bohall, Carson City, Oakland.
 44273...G. J. Smith, Reno, Buick.
 44274...T. F. McNamara, Reno, Ford.
 44275...J. T. Brady, Carson City, Ford.
 44276...Watkins & Sheehan, Fernley, Oldsmo.
 44277...Watkins & Sheehan, Fernley, Ford.
 44278...W. A. Murphy, Tonopah, Republic.
 44279...W. S. Everett, Hazen, Oldsmobile.
 44280...Mrs. J. J. Rossiter, Sparks, Ford.
 44281...B. M. Shelly, Sparks, Ford.
 44282...W. E. Eagleson, Sparks, Buick.
 44283...M. E. Vort, Reno, Maxwell.
 44284...Rudolf Miller, Fernley, Lexington.
 44285...Rudolf Miller, Fernley, Ford.
 44286...A. B. Sandberg, Lovelock, Buick.
 44287...E. R. Albee, Wadsworth, Studebaker.
 44288...Mrs. S. L. Jackson, Reno, Studebaker.
 44289...S. E. Davis, Reno, Dodge.
 44290...Frank J. Bryington, Reno, Ford.
 44291...Armstrong & Baker, Fallon, Chevrolet.
 44292...Harry Hammersmith, Reno, Ford.
 44293...U. G. Persing, Reno, Buick.
 44294...Louis Mantel, Sparks, Ford.
 44295...Albert Johnson, Tonopah, Ford.
 44296...D. Zolezzi, Reno, Buick.
 44297...N. B. Epperson, Sparks, Maxwell.
 44298...N. B. Epperson, Sparks, Ford.
 44299...Arthur Shaw, Fallon, Overland.
 44300...W. D. Moody, Fallon, Cadillac.
 44301...J. P. Saguepe, Fallon, Buick.
 44302...True Vencill, Fallon, Nash.
 44303...A. M. Olin, Elko, Studebaker.
 44304...P. H. Walsh, Austin, Chandler.
 44305...E. Ashton, Fallon, Overland.
 44306...R. S. Mackinson, Fallon, Ford.
 44307...R. J. Kolstrup, Fallon, Buick.
 44308...Parker Liddell, Reno, Chevrolet.
 44309...Parker Liddell, Reno, Universal.
 44310...A. G. Ward, Reno, Ford.
 44311...T. C. Sharpe, Reno, Reo.
 44312...A. L. Merrill, Reno, Ford.
 44313...William Arthur, McGill, Ford.
 44314...W. Dee Jones, Mina, Ford.
 44315...John P. Caulfield, Sr., Ruth, Paige.
 44316...Elmer A. Ford, Reno, Studebaker.
 44317...C. R. Gilkey, Thorne, Hupmobile.
 44318...A. C. Bachman, Ludwig, Ford.
 44319...T. J. Bell, Austin, Ford.
 44320...Jessie B. Falts, Lovelock, Briscoe.

- 44321...J. Bernasconi, Reno, Ford.
 44322...J. H. Bitner, Ruth, Ford.
 44323...A. Spitz, McGill, Ford.
 44324...Dr. J. A. Wallace, Ely, Premier.
 44325...Union Hide Co., Reno, Ford.
 44326...W. Fugate, Reno, Ford.
 44327...Jack Segale, Reno, Ford.
 44328...E. Barber, Reno, Cadillac.
 44329...P. Christenson, Reno, Ford.
 44330...Reno Mercantile Co., Reno, Ford.
 44331...E. W. Butler, Reno, Cadillac.
 44332...F. H. Hartung, Reno, Reo.
 44333...C. M. Bradner, Tonopah, Crow Elkhart.
 44334...P. A. Petrini, Tonopah, Chevrolet.
 44335...W. B. Evans, Tonopah, Dodge.
 44336...W. B. Evans, Tonopah, Dodge.
 44337...W. B. Evans, Tonopah, Ford.
 44338...Jos. R. Perry, Goldfield, Dodge.
 44339...W. B. Braden, Goldfield, Ford.
 44340...J. J. Jordan, Goldfield, Oakland.
 44341...Pat McAuliffe, Goldfield, Ford.
 44342...P. V. Perkins, Carrara, Ford.
 44343...Wanacott & Cavanaugh, Tonopah, Sax.
 44344...Geo. Bierger, Round Mtn., Ford.
 44345...E. Farney, Wabaska, Chevrolet.
 44346...J. H. Holman, Millett, Dodge.
 44347...City Market, Ely, Ford.
 44348...Royal Bakery, Ely, Dodge.
 44349...J. M. Carr, Manhattan, Oakland.
 44350...A. S. Givens, McGill, Chevrolet.
 44351...John Crowe, Pioche, Ford.
 44352...A. A. Wart, Eureka, Overland.
 44353...Victor Jacobson, Midas, Oldsmobile.
 44354...F. M. Schmitt, McGill, Ford.
 44355...Jno. A. Manson, Current, Ford.
 44356...Casier Bros., Current, Ford.
 44357...W. H. Shetton, Ruth, Maxwell.
 44358...Mike Sals, Ely, Overland.
 44359...Herbert Alger, Caliente, Ford.
 44360...L. S. Weathers, Death, Dodge.
 44361...W. H. Leonard, Rawhide, Ford.
 44362...Murphy Williams, Schurz, Dodge.
 44363...R. C. Rose, Yerington, Metz.
 44364...Hosea P. Campbell, Yerington, Cad.
 44365...Mrs. D. J. Butler, Yerington, Buick.
 44366...Ray W. Tillay, Yerington, Ford.
 44367...Harry Johnson, Carson, Lexington.
 44368...Adolfo Pellegrini, Yerington, Ford.
 44369...E. O. Shaughnessy, Yerington, Reo.
 44370...W. A. Swalby, Thompson, Ford.
 44371...A. L. Scott, Pioche, Buick.
 44372...Mrs. C. C. Maggini, Eureka, Chevrolet.
 44373...St. J. L. Taw, Lovelock, Chevrolet.
 44374...L. S. Young, Lovelock, Oakland.
 44375...L. S. Young, Lovelock, Oldsmobile.
 44376...R. A. McGuire, Lovelock, Reo.
 44377...Matt Smith, Lovelock, Oakland.
 44378...Herbert Fieldson, Caliente, Ford.
 44379...John T. Rees, Ft. McDermitt, Ford.
 44380...Mrs. Jas. Low, McDermitt, Ford.
 44381...Mrs. Nettie Topagna, Reno, Studebkr.
 44382...E. R. Berg, Reno, Dodge.
 44383...Geo. Sauer, Reno, Reo.
 44384...Geo. Sauer, Reno, Ford.
 44385...Elmer L. Armstrong, Reno, Chevrolet.
 44386...Humphrey Supply Co., Reno, Ford.
 44387...Humphrey Supply Co., Reno, Ford.
 44388...Humphrey Supply Co., Reno, Reo.
 44389...Humphrey Supply Co., Reno, Ford.
 44390...Humphrey Supply Co., Reno, Reo.
 44391...Humphrey Supply Co., Reno, Reo.
 44392...H. L. Nichols, Reno, Reo.
 44393...K. Joe Rankin, Jean, Buick.
 44394...R. N. Barnett, Reno, Jackson.
 44395...G. B. Spradling, Carson City, Ford.
 44396...Reno Mercantile Co., Reno, Ford.
 44397...Geo. S. Spencer, Sparks, Dodge.
 44398...Roy B. Speers, Sparks, Hubmobile.
 44399...F. S. Jones, Sparks, Maxwell.
 44400...W. A. Rochambeau, Sparks, Buick.
 44401...Fred D. Black, Reno, Ford.
 44402...J. F. Derig, Thorne, Ford.
 44403...A. G. Sturgeon, Mason, Ford.
 44404...Mrs. A. L. Eaton, Reno, Ford.
 44405...B. H. Briggs, Reno, Chevrolet.
 44406...Nevada M. & E. Wks., Reno, Chevrolet.
 44407...Carson Creamery, Carson City, Ford.
 44408...L. H. Bartholomew, Reno, Chevrolet.
 44409...J. A. Dodson, Carson City, Ford.
 44410...Jack Kehoe, Reno, Studebaker.
 44411...Jack Kehoe, Reno, Oldsmobile.
 44412...Roy Neamith, Carson City, Ford.
 44413...J. G. Lockridge, Sparks, Ford.
 44414...Wm. G. Baker, Sparks, Ford.
 44415...D. F. Burk, Carson City, Ford.
 44416...Nye County, Tonopah, Ford.
 44417...Alden P. Ferguson, Arrowhead, Dodge.
 44418...Ely Racheff, Tonopah, Cadillac.
 44419...John Barrier, Tonopah, Hupmobile.
 44420...B. M. Bateman, Tonopah, Dodge.
 44421...Nye County, Tonopah, Dodge.
 44422...Nye County, Tonopah, Ford.
 44423...Town of Tonopah, Tonopah, Brock.
 44424...Nye County, Tonopah, Nash Quad.
 44425...Henry L. Grafious, Tonopah, Dodge.
 44426...F. M. Billings, Tonopah, Imperial.
 44427...Roy Taylor, Tonopah, Ford.
 44428...Nye County, Tonopah, Nash Quad.
 44429...E. S. Gladding, Virginia, Oakland.
 44430...Dr. A. Huffaker, Carson City, Buick.
 44431...Wm. J. Stack, Virginia, Dodge.
 44432...Herbert Coffin, Carson, Chevrolet.
 44433...J. L. Campbell, Genoa, Studebaker.
 44434...James Regan, Mound House, Ford.
 44435...Downer Bros., Goldfield, Dodge.
 44436...J. B. Kendall, Goldfield, Cadillac.
 44437...Mrs. N. V. Winkler, Goldfield, Dodge.
 44438...B. D. Billingshurst, Reno, Ford.
 44439...Wm. Ziegler, Manhattan, Ford.
 44440...L. M. Manger, Tonopah, Ford.
 44441...Thos. N. Cahill, Round Mtn., Dodge.
 44442...F. V. Wright, Tonopah, Dodge.
 44443...A. A. Mustard, Fallon, Oakland.
 44444...Geo. E. Edler, Reno, Buick.
 44445...E. B. Grable, Fallon, Case.
 44446...F. A. Harrigan, Fallon, Maxwell.
 44447...Rev. G. J. McMurtry, Fallon, Chevrolet.
 44448...E. J. Lyng, Elko, Eric.
 44449...Ben Wade, Gold Hill, Oakland.
 44450...M. J. Main, Elko, Franklin.
 44451...Con. Sullivan, Elko, Dodge.
 44452...Elko County, Elko, Dodge.
 44453...Adolph Biancani, Elko, Ford.
 44454...W. R. Coatney, Hasen, Oldsmobile.
 44455...Geo. W. Hanna, Elko, Reo.
 44456...Wittenberg T. Co., Tonopah, Hupmo.
 44457...Wittenberg T. Co., Tonopah, Dorris.
 44458...Wittenberg T. Co., Tonopah, Pierce-A.
 44459...Wittenberg T. Co., Tonopah, Pierce-A.
 44460...Wittenberg T. Co., Tonopah, Pierce-A.
 44461...Wittenberg T. Co., Tonopah, Chevrolet.
 44462...Wittenberg T. Co., Tonopah, Pierce-A.
 44463...Nevada Con. C. Co., McGill, Paige.
 44464...Nevada Con. C. Co., McGill, Franklin.
 44465...Nevada Con. C. Co., McGill, Reo.
 44466...Nevada Con. C. Co., McGill, Packard.
 44467...A. Labarthe, Goldfield, Ford.
 44468...I. B. Marsh, Stillwater, Ford.
 44469...W. G. Rawles, Fernley, Buick.
 44470...Y. Kimura, Yerington, Ford.
 44471...C. H. Masterson, Yerington, Ford.
 44472...M. T. Betencourt, Yerington, Overland.
 44473...D. McLaggan, Bruner, Ford.
 44474...Blanche H. Baker, Yerington, Dodge.
 44475...Olney Leighton, Eureka, Ford.
 44476...Elko Dray Co., Elko, Ford.
 44477...Elko Dray Co., Elko, Nash.
 44478...Mrs. W. C. Hancock, Battle Mtn., Reo.
 44479...Joseph B. Kiernan, Beatty, Ford.
 44480...Allied Divide M. Co., Goldfield, Ford.
 44481...Allied Divide M. Co., Goldfield, Buick.
 44482...R. H. Henderson, Montello, Dodge.
 44483...R. R. Rice, Reno, Dodge.
 44484...L. E. Shepley, Sparks, Studebaker.
 44485...Ralph Yalletti, Reno, Chandler.
 44486...A. F. McPhail, Sparks, Ford.
 44487...Wm. Eickbush, Reno, Ford.
 44488...Henry A. Hellwegren, Reno, Ford.
 44489...C. T. Gaby, Reno, Ford.
 44490...W. Prince Catlin, Reno, Ford.
 44491...Charles B. Hill, Sparks, Overland.
 44492...H. E. Reid, Reno, Willys-Knight.
 44493...L. D. Anderson, Derby, Dodge.
 44494...C. G. Buerer, Fallon, Chevrolet.

- 44495...M. Martenelli, Reno, Overland.
 44496...Mrs. J. H. Malloy, Fallon, Oakland.
 44497...E. Elliott, Elko, Ford.
 44498...I. A. Spoon, Fallon, Overland.
 44499...Thomas H. Elliott, Fallon, Ford.
 44500...R. T. Bright, Carson City, Dodge.
 44501...Dr. Donald McLean, Carson, Cadillac.
 44502...H. A. Wood, Carson, Ford.
 44503...Mrs. Jack Ede, Reno, Overland.
 44504...True Vencill, Fallon, Ford.
 44505...W. S. Allen, Jarbidge, Dodge.
 44506...W. J. Capell, Caliente, Ford.
 44507...Edw. T. George, Battle Mtn., Hupmo.
 44508...E. C. Hicks, Las Vegas, Ford.
 44509...Carol M. Pope, Reno, Ford.
 44510...S. A. Imelli, Gardnerville, Willys 6.
 44511...Domingo Oxybo, Yerington, Ford.
 44512...A. W. Archer, Wichman, Reo.
 44513...H. R. Lang, Gardnerville, Buick.
 44514...Hillygus & Koenig, Mason, Republic.
 44515...J. F. Hillygus, Mason, Oakland.
 44516...E. G. Barton, Ruth, Studebaker.
 44517...Mary S. McNamara, Reno, Ford.
 44518...L. E. Gunter, Reno, Hupmobile.
 44519...Hazel Mellan, Coaldale, Oldsmobile.
 44520...Ely Packing Co., Ely, Kissel.
 44521...Jas. Dautre, Schellbourne, Hudson.
 44522...L. Zadow, Ely, Dodge.
 44523...B. E. Walker, Ruth, Dodge.
 44524...Frank F. Williams, Ely, Pilot.
 44525...Collins Hdw. Co., Ely, Ford.
 44526...Ely Packing Co., Ely, Ford.
 44527...Ely Packing Co., Ely, Buick.
 44528...Joe Collins, Ely, Ford.
 44529...L. L. Chanslor, Ely, Ford.
 44530...W. F. Mendes, Duckwater, Reo.
 44531...Jas. Dautre, Schellbourne, Duplex.
 44532...E. L. Kelley, East Ely, Ford.
 44533...Andrew Ghiggeri, Ely, Ford.
 44534...Ed. Bennett, McGill, Ford.
 44535...F. J. Tilton, Reno, Essex.
 44536...Isadore Aronson, Reno, Republic.
 44537...F. P. Schopper, Reno, Ford.
 44538...Mrs. F. Whitburn, Reno, Chevrolet.
 44539...Ennis Brownla, Reno, Ford.
 44540...J. C. Becker, Reno, Buick.
 44541...Humphrey Supply Co., Fallon, Ford.
 44542...Fred A. Sawyer, Reno, Studebaker.
 44543...Tonopah Truck Co., Tonopah, Riker.
 44544...Tonopah Truck Co., Tonopah, Pierce.
 44545...Tonopah Truck Co., Tonopah, Pierce.
 44546...Tonopah Truck Co., Tonopah, Giant.
 44547...Tonopah Truck Co., Tonopah, Kleiber.
 44548...Tonopah Truck Co., Tonopah, Pierce.
 44549...Tonopah Truck Co., Tonopah, Hupmo.
 44550...Jos. L. Teis, Ely, Buick.
 44551...A. G. Harbaugh, Tonopah, Buick.
 44552...John D. Ray, Ely, Ford.
 44553...P. J. Metts, Ely, Ford.
 44554...J. B. Kitch, Ely, Overland.
 44555...J. C. Brumblay, Reno, Ford.
 44556...Mrs. H. M. Kaiser, Sparks, Ford.
 44557...Robt. Colgan, Fallon, Ford.
 44558...Frank T. Dunn, Tonopah, Overland.
 44559...Ed. C. Galsgie, Reno, Cadillac.
 44560...P. S. Gunter, Sparks, Ford.
 44561...P. S. Gunter, Sparks, Dodge.
 44562...J. J. Noone, Tonopah, Dodge.
 44563...F. Z. Seymour, Sparks, Chalmers.
 44564...H. W. Hill, Reno, Chalmers.
 44565...Royal Laundry, Reno, Ford.
 44566...Royal Laundry, Reno, Ford.
 44567...Singer S. M. Store, Reno, Ford.
 44568...L. H. Taylor, Reno, Dodge.
 44569...Mrs. E. Z. Williams, Reno, Hudson.
 44570...R. Green, Lovelock, Ford.
 44571...Roy Curtis, Reno, Hudson.
 44572...E. C. Simon, Ely, Ford.
 44573...E. W. Orr, Schellbourne, Ford.
 44574...F. L. Pierce, Cherry Creek, Ford.
 44575...F. E. Huffer, McGill, Hupmobile.
 44576...E. V. Gamble, East Ely, Reo.
 44577...H. E. R. Freeman, Ruth, Ford.
 44578...F. M. Doolittle, Las Vegas, Buick.
 44579...Rowland Gill, Lamolille, Oldsmobile.
 44580...Geo. L. Dilworth, Tonopah, Overland.
 44581...Mrs. M. J. Kelly, Manhattan, Ford.
 44582...Mrs. M. J. Kelly, Manhattan, Ford.
 44583...Nev. T. & T. Co., Tonopah, Ford.
 44584...Mrs. Ella Kind, Tonopah, Chandler.
 44585...Archie W. Hopper, Tonopah, Dodge.
 44586...C. M. Kennedy, Lone, Ford.
 44587...Glen De Cordova, Tonopah, Maxwell.
 44588...John W. McCann, Currant, Ford.
 44589...R. L. Read, Ely, Overland.
 44590...Mrs. F. Elges, Gardnerville, Hudson.
 44591...Fritz Elges, Gardnerville, Hudson.
 44592...R. C. Rogers, Mason, Ford.
 44593...Homer Lancaster, Mason, Chevrolet.
 44594...Joe A. Marshall, Luning, Ford.
 44595...Aaron Peterson, Hawthorne, Ford.
 44596...Chris. Jensen, Reno, Buick.
 44597...J. D. Cameron, Reno, Oakland.
 44598...Harold Parsons, Sparks, Howard.
 44599...B. G. Bleadale, Yerington, Overland.
 44600...H. R. Mighels, Carson City, Ford.
 44601...Nev. Stock Farm, Inc., Reno, Chevro.
 44602...G. W. Fisher, Carson City, Ford.
 44603...O. B. Gefeke, Gardnerville, Reo.
 44604...O. B. Gefeke, Gardnerville, Intl.
 44605...O. B. Gefeke, Gardnerville, Intl.
 44606...Robt. B. Wright, Stewart, Ford.
 44607...H. K. Haines, Carson City, Dodge.
 44608...Comstock Superior M. Co., Reno, Ford.
 44609...Fred Leutjens, Reno, Overland.
 44610...T. M. English, Stewart, Reo.
 44611...M. Sorani, Dayton, Chalmers.
 44612...H. S. Williams, Carson City, Dorris.
 44613...Mina Mercantile Co., Mina, Ford.
 44614...Mina Mercantile Co., Mina, Ford.
 44615...S. M. Summerfield, Mina, Hudson.
 44616...J. C. Jones, Fallon, Oakland.
 44617...J. E. Rogers, Copper Basin, Ford.
 44618...Reno Steam Laundry, Reno, Ford.
 44619...Reno Steam Laundry, Reno, Vim.
 44620...C. R. Swobe, Reno, Overland.
 44621...Jube J. Wright, Elko, Ford.
 44622...Lillian N. Ninnis, Tonopah, Chandler.
 44623...C. W. Grover, Carson City, Maxwell.
 44624...Charles L. Fulstone, Carson, Buick.
 44625...F. P. Starr, Battle Mtn., Ford.
 44626...F. P. Starr, Battle Mtn., Ford.
 44627...C. A. Hall, Battle Mtn., Ford.
 44628...Mrs. Hugh Brown, Tonopah, Hudson.
 44629...A. J. Rankin, Hazen, Overland.
 44630...Verdi Lumber Co., Elko, Buick.
 44631...Geo. W. Lattin, Fallon, Chevrolet.
 44632...C. P. Ball, Las Vegas, Willys-Util.
 44633...C. P. Ball, Las Vegas, Ford.
 44634...Geyser L. & C. Co., Pioche, Ford.
 44635...B. P. Howell, Reno, Dodge.
 44636...Yerington Electric Co., Yerington, Ford.
 44637...LeRoy F. Pike, Reno, Studebaker.
 44638...W. E. Cochran, Reno, Overland.
 44639...V. E. Thompson, Reno, Overland.
 44640...James Murphy, Mason, Ford.
 44641...A. Van Buren, Reno, Chevrolet.
 44642...Mrs. Lizzie Schmitt, Reno, Chevrolet.
 44643...G. W. Palmer, Reno, Paige.
 44644...F. M. Duncan, Reno, Monroe.
 44645...R. B. Van Meter, Reno, Ford.
 44646...J. S. Canning, Reno, Hudson.
 44647...Charles A. Hendel, Simpson, Ford.
 44648...Con. Imperial, Gold Hill, Chandler.
 44649...W. F. Dressler, Gardnerville, Buick.
 44650...W. F. Dressler, Gardnerville, Olds.
 44651...Wm F. Dressler, Gardnerville, Buick.
 44652...W. F. Dressler, Gardnerville, Cadillac.
 44653...Marta Heitman, Gardnerville, Chevrolet.
 44654...Douglas Mill Co., Gardnerville, Reo.
 44655...Farmers Coop. Co., Minden, Ford.
 44656...Merritt Olds Tr. Co., Minden, Intl.
 44657...Louis Ruhenstrath, Gardnerville, Buick.
 44658...H. H. Boone, Gardnerville, Overland.
 44659...Andrew Schole, Gardnerville, Buick.
 44660...James Hickey, Gardnerville, Ford.
 44661...Julia Klotz, Minden, Chevrolet.
 44662...Fred Flodter, Minden, Buick.
 44663...Bob Williams, Yerington, Ford.
 44664...A. R. Swart, Carson, Overland.
 44665...O. E. Baker, McGill, Ford.
 44666...Crystal Confectionery, Reno, Ford.

- 44669...Julia Mae Lynch, Tonopah, Dodge.
 44670...Operator-Divide M. Co., Tonopah, Rep.
 44671...Van E. Hallberg, Tonopah, Reo.
 44672...Harvey Hardy, Goode Springs, Overland.
 44673...Mrs. A. H. Woodard, Tonopah, Ford.
 44674...Frank E. Hanson, Yerington, Ford.
 44675...Fravel Paymaster M. Co., Reno, Fed.
 44676...Fravel Paymaster M. Co., Reno, Ford.
 44677...Clyde Cline, Wellington, Ford.
 44678...Lyon Co. High School, Dayton, Ford.
 44679...Arthur Nesbit, Smith, Dodge.
 44680...Thomas Wangsgard, Hudson, Ford.
 44681...Ed. Carney, Virginia, Buick.
 44682...H. R. Landis, Reno, Chevrolet.
 44683...J. H. Steele, Reno, Studebaker.
 44684...B. Carano, Reno, Buick.
 44685...Miss Helen Presper, Reno, Ford.
 44686...Charles Johnson, Searchlight, Ford.
 44687...Annie McCubbin, Reno, Ford.
 44688...L. P. Walsh, Searchlight, Hupmobile.
 44689...Vance Brite, Searchlight, Apperson.
 44690...James E. Hansen, Hiko, Ford.
 44691...James E. Hansen, Hiko, Ford.
 44692...R. Grignon, Verdi, Reo.
 44693...L. E. Schwab, Jean, Buick.
 44694...J. J. Beatty, Dayton, Ford.
 44695...Carl A. Anderson, Carson City, Dodge.
 44696...Martin D. Lynch, Gold Hill, Oakland.
 44697...Thos. Burnen, Lovelock, Ford.
 44698...Peter C. Jakobi, Elko, Ford.
 44699...W. D. Knight, Carson City, Ford.
 44700...M. E. McGrath, Reno, Scripps-Booth.
 44701...Lauren Bearse, Battle Mtn., Overland.
 44702...George L. Eckman, Battle Mtn., Stude.
 44703...C. W. Cavitt, Reno, Reo.
 44704...O. G. Baumann, Fallon, Ford.
 44705...J. A. Casey, Fallon, Ford.
 44706...E. J. Lyons, Fallon, Ford.
 44707...Theo. Omundson, Fallon, Ford.
 44708...Frank Biggs, Fallon, Ford.
 44709...A. Testolin, Fallon, Ford.
 44710...R. E. Lee, Fallon, Ford.
 44711...J. S. Heady, Fallon, Studebaker.
 44712...F. J. Kelly, Elko, Dodge.
 44713...Mason Products Co., Elko, Reo.
 44714...Chris Westergard, Lovelock, Ford.
 44715...Edward Fontaine, Fernley, Oakland.
 44716...M. J. Riordan, Midas, Ford.
 44717...Eric Carlson, Midas, Overland.
 44718...Larry G. Bentz, Lovelock, Ford.
 44719...Oscar M. Emery, Sparks, Chevrolet.
 44720...Mrs. L. Bianchini, Sparks, Chevrolet.
 44721...Keith A. Emery, Sparks, Ford.
 44722...Geo. H. Danforth, Sparks, Maxwell.
 44723...Thompson & Arregni, Elko, Mack.
 44724...Thompson & Arregni, Elko, Mack.
 44725...C. E. Durfee, Elko, Oakland.
 44726...Harold P. Hale, Elko, Buick.
 44727...N. P. Morgan, Reno, Dodge.
 44728...H. Hagar, Cave Creek, Dodge.
 44729...Guy Brown, Elko, Dodge.
 44730...Jacob M. Summons, Gerlach, Ford.
 44731...Mrs. Chas. Berthold, Sparks, Ford.
 44732...W. G. Bryant, Reno, Overland.
 44733...Jas. T. Callahan, Reno, Ford.
 44734...J. S. Pamley, Montello, Oldsmobile.
 44735...Utah Constr. Co., Montello, Federal.
 44736...Utah Constr. Co., Montello, GMC.
 44737...C. E. Pembroke, Las Vegas, Velie.
 44738...A. J. Robbins, Goode Springs, Dodge.
 44739...Wm. J. Zachringer, Sparks, Reo.
 44740...Arthur G. Larson, Sparks, Maxwell.
 44741...A. B. Sisson, Sparks, Dodge.
 44742...Mrs. D. W. Melarkey, Reno, Overland.
 44743...M. R. Felts, Gerlach, Federal.
 44744...M. R. Felts, Gerlach, Chandler.
 44745...M. R. Felts, Gerlach, Federal.
 44746...Sam Frank, Reno, Buick.
 44747...Frank Ranch & Cattle Co., Fallon, Ford.
 44748...Alfred Huebner, Eureka, Ford.
 44749...Eureka Croesus M. Co., Eureka, Ford.
 44750...Baptista Etchemendy, Eureka, Olds.
 44751...Joe Dory, Eureka, Ford.
 44752...Eileen Morrison, Eureka, Dodge.
 44753...Bidart & Florio, Eureka, Hup.
 44754...C. H. H. Hjul, Eureka, Pope-Hartford.
 44755...A. Berolo, Eureka, Ford.
 44756...D. B. Rand, Palisade, Ford.
 44757...George Moore, Palisade, Ford.
 44758...Roy Woodin, Deeth, Ford.
 44759...Von L. Edwards, Carlin, Overland.
 44760...J. C. Ball, Reno, Ford.
 44761...Mrs. L. Benson, Ruby Valley, Dodge.
 44762...E. R. Short, Fallon, Dodge.
 44763...Wm. Gibson, Battle Mtn., Ford.
 44764...B. M. Clay, Luning, Ford.
 44765...F. A. Volmar, Silver Peak, Ford.
 44766...Arrowhead Annex Co., Tonopah, Ford.
 44767...Mrs. L. Monahan, Tonopah, Hudson.
 44768...C. E. Day, Wellington, Cadillac.
 44769...J. P. Faber, Wabuska, Ford.
 44770...Silver Gulch M. Co., Mina, Reo.
 44771...L. Mazade, Goldfield, Ford.
 44772...Homer Derr, Reno, Ford.
 44773...W. E. Sirbeck, Tonopah, Oakland.
 44774...John H. Dolan, Aurum, Ford.
 44775...Wm. B. Tuttle, Reno, Buick.
 44776...F. C. Nunnally, East Ely, Chandler.
 44777...James Potter, Baker, Ford.
 44778...C. A. Joseph, Tonopah, Ford.
 44779...Chas. L. Young, Tonopah, Ford.
 44780...B. & V. Tailors, Fallon, Ford.
 44781...D. B. Leyson, McGill, National.
 44782...Bertha E. Holcombe, Caliente, Ford.
 44783...W. H. Green, Fallon, Ford.
 44784...Bellinger & Moyle, Fallon, Ford.
 44785...T. L. Shear, Fallon, Ford.
 44786...J. E. Bruner, Fallon, Ford.
 44787...C. L. Benadum, Fallon, Service.
 44788...C. L. Benadum, Fallon, Ford.
 44789...C. L. Benadum, Fallon, Ford.
 44790...C. L. Benadum, Fallon, Dorris.
 44791...C. L. Benadum, Fallon, Dorris.
 44792...C. L. Benadum, Fallon, Ford.
 44793...Casellon & Shafer, Fallon, Stevens-D.
 44794...E. A. Sawyer, Ely, Jordan.
 44795...C. W. Stokesberry, Ely, Chevrolet.
 44796...Chas. H. Chester, East Ely, Ford.
 44797...F. F. Tighe, Dyer, Ford.
 44798...Tailings Association, Goldfield, Ford.
 44799...H. O. Lewis, Wichman, Ford.
 44800...H. O. Lewis, Wichman, Ford.
 44801...C. C. Miller, Sparks, Ford.
 44802...Geo. Hendryx, Reo, Ford.
 44803...J. A. McDonald, Verdi, Ford.
 44804...A. Solari, Reno, Ford.
 44805...C. O. Sherman, Reno, Ford.
 44806...John Ambrose, Reno, Ford.
 44807...Mrs. R. L. Branton, Reno, Ford.
 44808...Gerlach Livestock Co., Gerlach, Ford.
 44809...J. A. Prior, Gerlach, Chevrolet.
 44810...Gerlach Livestock Co., Gerlach, Ford.
 44811...J. Etchegoyhen, Golconda, Ford.
 44812...Dr. Starr, Reno, Studebaker.
 44813...Wm. Hansen, Gardnerville, Ford.
 44814...D. J. Park, Gardnerville, Ford.
 44815...Bert Marker, Lovelock, Ford.
 44816...Daniels Bros., Millett, Overland.
 44817...J. C. Johnson, Sparks, Oldsmobile.
 44818...Mrs. W. T. Kentner, Reno, Oldsmobile.
 44819...Rudolph Herz, Reno, Ford.
 44820...F. W. Brower, Mina, Willys-Overland.
 44821...F. O. Gilbert, Tonopah, Overland.
 44822...F. O. Gilbert, Tonopah, Chandler.
 44823...Merritt E. Bailey, Goldfield, Studebaker.
 44824...Fred Smith, Tonopah, Ford.
 44825...John S. Avilla, Reno, Overland.
 44826...John Larado, Reno, Hudson.
 44827...Myrtle B. Oliveira, Reno, Chalmers.
 44828...L. G. Stice, Wabuska, Ford.
 44829...M. F. Hill, Goldfield, Reo.
 44830...Mrs. R. C. Dyer, Schurz, Overland.
 44831...Dave Sharpe, Schurz, Ford.
 44832...J. B. Hardy, M.D., Reno, Buick.
 44833...Jas. J. Kelly, Yerington, Dodge.
 44834...Will Sauter, Yerington, Chevrolet.
 44835...J. T. Beckett, Yerington, Overland.
 44836...E. C. Haire, Yerington, Ford.
 44837...Angelo Margaroli, Yerington, Overland.
 44838...J. W. Wilson, Mason, Overland.
 44839...J. W. Wilson, Mason, Ford.
 44840...C. E. Southworth, Manhattan, Ford.
 44841...Albert Krapf, Tonopah, Ford.
 44842...H. A. Reid, Tonopah, Hudson.

- 44843...Goldsmith Divide M. Co., Tonopah, Oakl.
 44844...Allen Reeves, Tonopah, Dorris.
 44845...James Donovan, Tonopah, Ford.
 44846...W. A. Parker, Tonopah, Buick.
 44847...P. V. Meyer, Tonopah, Ford.
 44848...Wm. B. Fitzgerald, Tonopah, Ford.
 44849...O'Connell Bros., Tonopah, Ford.
 44850...O'Connell Bros., Tonopah, Ford.
 44851...W. H. Boyston, Tonopah, National.
 44852...C. A. Ingalls, Tonopah, Buick.
 44853...Mrs. C. Thursen, Reno, Hupmobile.
 44854...Hewitt Bros., Sparks, Grant.
 44855...A. Quilici & Co., Carson City, Buick.
 44856...Geo. A. English, Caliente, Ford.
 44857...Water Co. of Tonopah, Tonopah, Ford.
 44858...John McGee, Tonopah, Ford.
 44859...Charles Brown, Tonopah, Ford.
 44860...Con. Imperial M. Co., Gold Hill, Ford.
 44861...Pat Ahern, Tonopah, Auburn.
 44862...L. Ancehala, Golconda, Dodge.
 44863...F. N. Fletcher, Carson City, Studebkr.
 44864...Martha Baumann, Fallon, Chevrolet.
 44865...M. F. Turnage, Carson City, Ford.
 44866...W. P. Harmon, Fallon, Chevrolet.
 44867...J. M. Stratford, Fallon, Studebaker.
 44868...Dan Callahan, Fallon, Studebaker.
 44869...E. E. Owsley, Fallon, Buick.
 44870...J. W. Johnson, Fallon, Chevrolet.
 44871...C. E. Allen, Fallon, Dodge.
 44872...Ugo Del Grande, Verdi, Overland.
 44873...G. Petriciani, Reno, Haynes.
 44874...R. Herz Realty Co., Reno, Studebaker.
 44875...J. F. Bowler, Austin, Ford.
 44876...J. F. Bowler, Austin, Hudson.
 44877...Wm. Ackerman, Ely, Case.
 44878...John W. Bettendorff, Ely, Chevrolet.
 44879...B. L. Quayle, Ely, Franklin.
 44880...Mrs. H. J. R. Tietz, Ely, Hupmobile.
 44881...J. W. Henderson, Tonopah, Overland.
 44882...Apex G. & H. Co., Tonopah, Oldsmo.
 44883...H. D. Heywood, Tonopah, Federal.
 44884...Geo. A. Roberts & Co., Tonopah, Ford.
 44885...Mrs. Frank Meyer, Tonopah, Ford.
 44886...Joe Pedro, Tonopah, Stoddard-Dayton.
 44887...Oswald Combe, Tonopah, Ford.
 44888...R. B. Sorenson, Tonopah, Buick.
 44889...L. H. Abernattrey, Tonopah, Ford.
 44890...Valley Constr. Co., Lovelock, Ford.
 44891...James Rowe, Reno, Chevrolet.
 44892...Otto Werner, Reno, Ford.
 44893...Stephen S. Clark, Tonopah, Ford.
 44894...A. T. Cook, Round Mtn., Ford.
 44895...John Donnelly, Tonopah, Buick.
 44896...Tonopah Bot. Works, Tonopah, Ford.
 44897...Tonopah Bot. Works, Tonopah, Ford.
 44898...Jennie B. Peterman, Tonopah, Dodge.
 44899...Jennie B. Peterman, Tonopah, Garford.
 44900...Ed. Connell, Carson City, Maxwell.
 44901...E. E. Winters, Fallon, Chevrolet.
 44902...G. C. Kallenback, Fallon, Overland.
 44903...Harry Highfield, Carlin, Hollier 8.
 44904...John S. Park, Las Vegas, Detroit Elec.
 44905...Geo. H. Sharp, Currant, Ford.
 44906...Samuel L. Bryan, Reno, Overland.
 44907...Howard F. McKissick, Reno, Hudson.
 44908...G. B. Cook, Fallon, Ford.
 44909...Mrs. G. C. Lattin, Fallon, Dodge.
 44910...Montana-Ton. M. Co., Tonopah, Cad.
 44911...Harry R. Grier, Tonopah, Studebaker.
 44912...Round Mtn., M. Co., Rd. Mtn., Packard.
 44913...T. V. Daman, Yerington, Buick.
 44914...Gray, Reid, Wright Co., Reno, Ford.
 44915...Gray, Reid, Wright Co., Reno, Ford.
 44916...Gray, Reid, Wright Co., Reno, Ford.
 44917...L. S. Adams, Las Vegas, Maxwell.
 44918...C. E. Day, Wellington, Buick.
 44919...J. F. Walsh, Austin, Hudson.
 44920...John Collins, Austin, Ford.
 44921...C. A. French, Las Vegas, Ford.
 44922...J. C. Phillipi, Austin, Grant.
 44923...W. I. Mitchell Co., Reno, Ford.
 44924...James Paterson, Reno, Reo.
 44925...Mrs. A. Paterson, Reno, Chandler.
 44926...H. E. Muleahy, Sparks, Buick.
 44927...John F. Horne, McGill, Dodge.
 44928...H. P. Davis, Montello, Buick.
 44929...Frank E. Edwards, Panaca, Dodge.
 44930...Geo. L. Dorothy, Pioche, Dodge.
 44931...Henry R. Shade, Virginia, Dodge.
 44932...Walter Nelson, Fallon, Ford.
 44933...S. R. Downs, Fallon, Buick.
 44934...Wm. L. Warren, Sparks, Cadillac.
 44935...Percy E. Mills, Fallon, Ford.
 44936...F. G. Thiese, Lovelock, Studebaker.
 44937...Lovelock Merc. Co., Lovelock, Intl.
 44938...H. W. Robinson, Lovelock, Saxon.
 44939...Lovelock Merc. Co., Lovelock, Ford.
 44940...Reno Pl. & Heat Co., Reno, Studebaker.
 44941...C. W. Westover, Reno, Buick.
 44942...Hosp. for Mental Dis., Reno, Ford.
 44943...Hosp. for Mental Dis., Reno, Olds.
 44944...Leach Bros. Co., Cherry Creek, Ford.
 44945...Noble M. Co. of Nev., Pioche, Jeffery.
 44946...Chas. Huber, Tonopah, Overland.
 44947...S. D. Pepin, Las Vegas, Dodge.
 44948...R. B. Royer, Tonopah, Buick.
 44949...Harry Hoffman, Tonopah, Cadillac.
 44950...J. G. Crumley, Tonopah, Stearns.
 44951...Apex G. & H. Co., Tonopah, Ford.
 44952...John Thies, Carson City, Ford.
 44953...Willie Cassinelli, Reno, Overland.
 44954...N. H. Schweis, Reno, Buick.
 44955...J. C. Games, Reno, Dodge.
 44957...J. C. Games, Reno, Federal.
 44957...J. C. Games, Reno, Federal.
 44958...John C. Crane, Gerlach, Ford.
 44959...A. Kiser, Reno, Chevrolet.
 44960...F. J. Roberts, Hudson, Ford.
 44961...W. H. Beagle, Mason, Hupmobile.
 44962...R. M. Kidder, Mason, Overland.
 44963...C. G. Foster, Simpson, Chalmers.
 44964...Lloyd Darby, Wellington, Ford.
 44965...James Newall, Smith, Ford.
 44966...Miles Hovey, Wellington, Ford.
 44967...C. Morrison, Genoa, Ford.
 44968...N. P. Morrison, Genoa, Buick.
 44969...Theo. Schneider, Hudson, Maxwell.
 44970...Leroy Taylor, Hudson, Ford.
 44971...A. Charlebois, Yerington, Reo.
 44972...Ike Strosnider, Yerington, Buick.
 44973...Dale B. Pruett, Carson City, Saxon.
 44974...J. W. Vanoy, Fallon, Reo.
 44975...Isaac Woodhouse, Arthur, Studebaker.
 44976...Wm. Thompson, Montello, Ford.
 44977...Arthur Perkins, Winnemucca, Ford.
 44978...Frank Avansino, Verdi, Dodge.
 44979...Harry Hansen, Fallon, Ford.
 44980...E. C. Marty, Tonopah, Ford.
 44981...H. J. Kinkad, Fallon, Ford.
 44982...Rick De Bernardi, Reno, Reo.
 44983...S. E. Smith, Manhattan, Ford.
 44984...J. S. Lyons, Steamboat, Chevrolet.
 44985...J. S. Lyons, Steamboat, Mitchell.
 44986...Boes Gold M. Co., Goodsprings, Buick.
 44987...Thos. Griffin, Carlin, Ford.
 44988...Martin Hoffman, Dayton, Ford.
 44989...G. L. Dempsey, Dayton, Ford.
 44990...G. L. Dempsey, Dayton, Ford.
 44991...O. P. Riker, Yerington, Rambler.
 44992...Ernest F. Leavitt, Mesquite, Ford.
 44993...Manuel P. Mouro, Wellington, Ford.
 44994...A. S. Phipps, Yerington, Reo.
 44995...H. D. Frenan, Yerington, Ford.
 44996...E. H. Markwell, Yerington, Ford.
 44997...Mrs. M. A. Vannoy, Yerington, Ford.
 44998...Mrs. C. Harris, Yerington, Overland.
 44999...Ben Heseltine, Oreana, Ford.
 45000...Ben D. Luce, Tonopah, Hudson.
 45001...Tom Williamson, Fallon, Ford.
 45002...Tom Williamson, Fallon, Ford.
 45003...John Freeman Co., Stillwater, Ford.
 45004...John Freeman Co., Stillwater, Oldsmo.
 45005...C. P. Whitney, Fallon, Dort.
 45006...Pat McDonnell, Fallon, Hupmobile.
 45007...John Thom, Fallon, Overland.
 45008...L. D. Stuart, Fallon, Ford.
 45009...John B. Ferguson, Fallon, Buick.
 45010...Mrs. Chris. Johnson, Tonopah, Buick.
 45011...Jay S. Jones, Amos, Jeffery.
 45012...Jay S. Jones, Amos, Ford.
 45013...Charles J. Stitt, Tonopah, Hupmobile.
 45014...F. W. Stall, Tonopah, Buick.
 45015...E. Molini, Dyer, Studebaker.
 45016...Molini Bros., Dyer, Studebaker.

- 45017...S. H. Wheeler, Reno, Studebaker.
 45018...J. Filippelli, Reno, Dodge.
 45019...Geo. W. Malone, Reno, Packard.
 45020...Mrs. Gertrude Hammond, Reno, Reo.
 45021...Roy Clemins, Lovelock, Dodge.
 45022...William Kottke, Battle Mtn., Ford.
 45023...J. R. Schultz, Carson City, Buick.
 45024...H. L. Wagner, Reno, Ford.
 45025...Pouring & Garson, Verdi, Reo.
 45026...Severino Vietti, Reno, Reo.
 45027...F. M. North, Manhattan, Chevrolet.
 45028...Rochester M. Co., Rochester, Dodge.
 45029...Rochester M. Co., Rochester, Ford.
 45030...John Uhart, Carson City, Haynes.
 45031...Leo Hawkins, Carson City, Ford.
 45032...Pete McClure, Reno, Chalmers.
 45033...Wallace MacGregor, Tonopah, Buick.
 45034...J. A. Bielar, Carlin, Ford.
 45035...J. A. Bielar, Carlin, Ford.
 45036...Mrs. S. C. Weeks, Wells, Ford.
 45037...M. Brambauer, Reno, Buick.
 45038...E. T. Wardlaw, Lovelock, Ford.
 45039...Mrs. E. B. Brown, Reno, Saxon.
 45040...C. W. Pierce, Reno, Buick.
 45041...Sam Best, Dyer, Ford.
 45042...United C. & P. Co., Tonopah, Ford.
 45043...Gold Zone Divide M. Co., Tonopah, Ford.
 45044...A. C. Jones, Ely, Ford.
 45045...U. S. Indian Service, Stewart, Ford.
 45046...Joe Chebotarewicz, Yerington, Overland.
 45047...Ton. Belmont Dev. Co., Tonopah, Cad.
 45048...Wm. B. Lorditch, Sparks, Overland.
 45049...James T. Knox, Sparks, Studebaker.
 45050...John Elisonberry, Carson, Dodge.
 45051...Mrs. Alice Millen, Reno, Ford.
 45052...John Hohnson, Reno, Buick.
 45053...S. H. Newton, Reno, Buick.
 45054...C. E. Kingsley, Yerington, Buick.
 45055...Geo. Ewan, Lovelock, Ford.
 45056...Chris Beck, Lovelock, Overland.
 45057...H. B. McDonald, Lovelock, Ford.
 45058...Bert Stoker, Lovelock, Ford.
 45059...Sam O'Connell, Lovelock, Dodge.
 45060...Geo. Vance, Lovelock, Buick.
 45061...Cy Cox, Lovelock, Ford.
 45062...G. C. Brown, Lovelock, Ford.
 45063...Joseph Hill, Lovelock, Liberty.
 45064...C. H. Olds, Jr., Goldfield, Reo.
 45065...C. H. Olds, Jr., Goldfield, Overland.
 45066...Mike Brunette, Bonnie Clare, Loco.
 45067...Vignole & Chatom, Beatty, Ford.
 45068...J. B. O'Brien Lynd, Carrara, Ford.
 45069...John Etchebarren, Reno, Cadillac.
 45070...W. J. Greer, Reno, Studebaker.
 45071...Al. W. Buetter, Reno, Buick.
 45072...Dr. S. E. Bamberger, Reno, Overland.
 45073...A. R. Wainescott, Fallon, Maxwell.
 45074...O. D. Batchelor, Reno, Maxwell.
 45075...R. Sandusky, Reno, Buick.
 45076...L. E. Scott, Reno, Ford.
 45077...O. C. De Chene, Reno, Ford.
 45078...N. K. Franklin, Tonopah, Dodge.
 45079...John B. Field, Reno, Buick.
 45080...Ernest L. Hall, Reno, Oakland.
 45081...Carl Gillburg, Elko, Kissel.
 45082...Morley Griswold, Elko, Chevrolet.
 45083...Elko Meat & Grocery Co., Elko, Ford.
 45084...John Gzonecchi, Jiggs, Hudson.
 45085...J. M. Ryan, Elko, Chevrolet.
 45086...Cazier & Sons Co., Wells, Dodge.
 45087...John I. Cazier, Wells, Dodge.
 45088...H. J. Schmith, Battle Mtn., Ford.
 45089...E. L. Bachman, Elko, Dodge.
 45090...Jas. H. Canfield, Montello, Ford.
 45091...W. S. Burks, Steamboat, Hudson.
 45092...Chas. Labbe, Las Vegas, Ford.
 45093...John Garrecht, Elko, Overland.
 45094...R. W. Martin, Las Vegas, Hudson.
 45095...Oscar J. Streeter, Elko, Ford.
 45096...Kenneth Tisdale, Las Vegas, Dodge.
 45097...F. B. McGrady, Las Vegas, Ford.
 45098...Ed. C. Brooks, Las Vegas, Maxwell.
 45099...W. M. Penrose, Wabuska, Ford.
 45100...W. M. Penrose, Wabuska, Ford.
 45101...R. C. Gilbert, Elko, Dodge.
 45102...W. H. Elbrecht, Elko, Saxon.
 45103...W. H. Elbrecht, Elko, Saxon.
 45104...Ton. M. Co. of Nev., Tonopah, Hup.
 45105...Ton. M. Co. of Nev., Tonopah, Ford.
 45106...Ton. M. Co. of Nev., Tonopah, Mitchell.
 45107...Ton. M. Co. of Nev., Tonopah, Winton.
 45108...H. G. Knight, Tonopah, Ford.
 45109...Joseph Binder, Tonopah, Ford.
 45110...J. G. Frank, Tonopah, Overland.
 45111...Mrs. H. R. James, Tonopah, Ford.
 45112...Miss Jessie Rawles, Tybo, Ford.
 45113...David A. Stevens, Tonopah, Paige.
 45114...J. S. Flanders, Tonopah, Ford.
 45115...W. L. Paul, Elko, Mack.
 45116...W. L. Paul, Elko, Ford.
 45117...W. R. Swicegood, Tonopah, Maxwell.
 45118...Silver Peak Chem. Co., Tonopah, Ind.
 45119...Silver Peak Chem. Co., Tonopah, Dodge.
 45120...C. T. Ellerman, Tonopah, Ford.
 45121...James Duffy, Tonopah, Ford.
 45122...J. H. Robinson, Stewart, Jeffrey.
 45123...J. Y. Kesler, Santa Ana, Cal., Chevrolet.
 45124...Mammoth Divide M. Co., Tonopah, GMC.
 45125...Louis Stodieck, Gardnerville, Lexington.
 45126...Louis Stodieck, Gardnerville, Buick.
 45127...S. Roth, Reno, Ford.
 45128...Robershotte Bros., Smith, Reo.
 45129...John Sandman, Yerington, Oakland.
 45130...A. L. Seymour, Sparks, Dort.
 45131...Iver M. Iversen, Reno, Buick.
 45132...Chas. D. Roder, Reno, Chevrolet.
 45133...L. Rosasco, Reno, Chevrolet.
 45134...Peter Jensen, Gardnerville, Overland.
 45135...Peter Jacobsen, Gardnerville, Ford.
 45136...Sam Leon, Gardnerville, Lexington.
 45137...Wm. Muller, Gardnerville, Chevrolet.
 45138...Fritz Cordes, Gardnerville, Overland.
 45139...Minden Butter Co., Minden, Kleiber.
 45140...Henry H. Cordes, Genoa, Buick.
 45141...B. H. Wyant, Mina, Ford.
 45142...John Cossar, Gardnerville, Chevrolet.
 45143...W. V. Nielsen, Gardnerville, Maxwell.
 45144...E. P. Donohue, Pioche, Chevrolet.
 45145...George Brodigan, Carson, Overland.
 45146...W. J. Greer, Reno, Ford.
 45147...John E. Amenda, Ely, Empire.
 45148...S. Pierini, Empire, Dodge.
 45149...E. R. Morton, Reno, Ford.
 45150...Lafayette M. Co., Tonopah, GMC.
 45151...W. M. Kearney, Reno, Pope-Hartford.
 45152...C. E. Babb, Fallon, Ford.
 45153...Bert Acree, Austin, Overland.
 45154...Geo. A. Browne, Reno, Ford.
 45155...J. W. Scott, Reno, Buick.
 45156...C. A. Jones, Fallon, Chalmers.
 45157...C. A. Jones, Fallon, Buick.
 45158...Mrs. J. M. Wildes, Fallon, Chevrolet.
 45159...Jesse Bryant, Gerlach, Studebaker.
 45160...M. C. Hassett, Mina, Ford.
 45161...Burge Bros., Paradise Valley, Ford.
 45162...Edwards Hdw. Co., Reno, Ford.
 45163...A. W. Edwards, Reno, Haynes.
 45164...C. B. Staup, Fallon, Ford.
 45165...Joe Harrigan, Fallon, Ford.
 45166...C. K. Beaman, Wellington, Dodge.
 45167...Bruno Junger, Goldfield, Stoddard-D.
 45168...Louis R. Hille, Las Vegas, Oldsmo.
 45169...F. Simonetti, Yerington, Ford.
 45170...Thomas H. May, Hazen, Overland.
 45171...Frank Charlie, Austin, Ford.
 45172...C. A. Breunen, Elko, Dodge.
 45173...Mrs. Edwin Carville, Elko, Dodge.
 45174...Joseph Mitchell, Goldfield, Studebaker.
 45175...Ralph Davis, Fallon, Ford.
 45176...Mrs. F. A. Litch, Reno, Dodge.
 45177...H. L. Smith, Reno, Liberty.
 45178...Wm. Wilson, Reno, Ford.
 45179...Joe Lowery, Nixon, Ford.
 45180...D. C. Hidever, Tonopah, Ford.
 45181...H. V. Sandry, Tonopah, Ford.
 45182...T. R. Landsborough, Tonopah, Buick.
 45183...W. H. Bowler, Tonopah, Buick.
 45184...Richard Finn, Tonopah, Ford.
 45185...D. S. Malkovich, Tonopah, Ford.
 45186...Nick Howe, Tonopah, Ford.
 45187...J. B. McKee, Lee, Hudson.
 45188...Robert Brady, Ely, Buick.
 45189...Mace Clays, Ely, Maxwell.
 45190...Data Brothers, Kimberly, Reo.

- 45191...Louis Giannopoulos, Ruth, Oldsmobile.
 45192...Hyrum Whitlock, Ely, Ford.
 45193...W. L. Blackwell, Simpson, Oldsmobile.
 45194...W. L. Blackwell, Simpson, Ford.
 45195...E. H. Bath, Carson City, Ford.
 45196...Fritz Bahlman, Sheridan, Overland.
 45197...C. W. Pearl, McDermitt, Ford.
 45198...Bohnert Bros., Winnemucca, Ford.
 45199...Winne. Merc. Co., Winnemucca, Ford.
 45200...Winne. Merc. Co., Winnemucca, Ford.
 45201...L. G. Merton, Ruth, Ford.
 45202...J. E. Long, Ely, Dodge.
 45203...D. P. Bartley, Ely, Cadillac.
 45204...Fred J. Schwab, Ely, Ford.
 45205...Wm. Hacker, Ely, Ford.
 45206...J. H. Eastman, Ely, Ford.
 45207...C. B. H. Wheless, Ely, Chevrolet.
 45208...Dick House, Ely, Ford.
 45209...A. A. Thiessen, Kimberly, Ford.
 45210...J. P. Rumbaugh, East Ely, Jeffries.
 45211...Wyoming M. & M. Co., Ely, Buick.
 45212...Alex Baird, Ely, Ford.
 45213...Baird Bros., Ely, Dodge.
 45214...W. A. Vance, Ely, Dodge.
 45215...D. P. Curto, East Ely, Ford.
 45216...Mrs. Fred Butler, Sparks, Overland.
 45217...J. H. Cazier & Sons Co., Wells, Ford.
 45218...J. H. Cazier & Sons Co., Wells, Ford.
 45219...Mrs. S. A. Johnstone, Reno, Ford.
 45220...Louis Raymond, Midas, Ford.
 45221...Ira Slaughter, Pioche, Pullman.
 45222...Henrie & Thieriot, Alamo, Ford.
 45223...Henrie & Thieriot, Alamo, Studebaker.
 45224...Dale V. Clanton, Reno, Ford.
 45225...James Dahl, Battle Mountain, Ford.
 45226...Joe Saval, Battle Mountain, Reno.
 45227...Joe Saval, Battle Mountain, Ford.
 45228...Mrs. A. B. Phillips, Beowawe, Ford.
 45229...J. P. Jacobsen, Birch, Ford.
 45230...Mrs. C. Glaser, Halleck, Studebaker.
 45231...Mrs. C. Glaser, Halleck, Ford.
 45232...D. Quillici Bros., Wells, Dodge.
 45233...D. Quillici Bros., Wells, Ford.
 45234...W. J. Hahn, Reno, Michigan.
 45235...Robt. Lewers, Reno, Willys-Knight.
 45236...Alex Gardner, Deeth, Dodge.
 45237...Sam Cook, Elko, Dodge.
 45238...Clarke Brown, Lee, Dodge.
 45239...Verdi Lbr. Co., Winnemucca, Essex.
 45240...H. Peterson, Reno, Dodge.
 45241...Elko Prince M. Co., Midas, Olds.
 45242...Elko Prince M. Co., Midas, Overland.
 45243...Robert McSherry, Tonopah, Reno.
 45244...Martin H. Lund, Reno, Ford.
 45245...Brooks & Peckham, Reno, Reno.
 45246...H. A. Leach, Wells, Oldsmobile.
 45247...Mrs. H. A. Leach, Wells, Chevrolet.
 45248...E. Bollschweiler, Wells, Ford.
 45249...William Dunne, Fallon, Maxwell.
 45250...E. J. Burgess, Tonopah, Ford.
 45251...Helen R. Shipley, Tonopah, Dodge.
 45252...C. E. Stewart, Tonopah, Ford.
 45253...Marl A. Page, Keystone, Ford.
 45254...Geo. T. Hislop, Tonopah, Acme.
 45255...Geo. T. Hislop, Tonopah, Republic.
 45256...Goldfield Con. M. Co., Goldfield, Pack.
 45257...Re-org. Booth M. Co., Goldfield, Buick.
 45258...Goldfield Con. M. Co., Goldfield, Buick.
 45259...J. G. Dawson, Reno, Willys-6.
 45260...Nick Sorge, Reno, Oldsmobile.
 45261...R. C. Stoddard, Reno, Reno.
 45262...Morris Tracy, Tonopah, Ford.
 45263...Tom Harper, Fallon, Ford.
 45264...Edmond Dietz, Northam, Buick.
 45265...Chas. Summer, Mina, Ford.
 45266...E. P. Forkapich, Mina, Ford.
 45267...Philip W. Baker, Baker, Ford.
 45268...L. E. Brown, Reno, Ford.
 45269...Sam Murray, Reno, Ford.
 45270...Star Transfer, Reno, Ford.
 45271...Frank W. Henry, Cherry Creek, Ford.
 45272...C. L. Steiner, Sparks, Reno.
 45273...Young Goodin Co., Lovelock, Vim.
 45274...E. R. Albee, Wadsworth, Ford.
 45275...I. L. Baker, Lovelock, Overland.
 45276...Henry Peterson, Lee, Chevrolet.
 45277...Jos. L. Kirkley, Reno, Ford.
 45278...E. M. Kirchen, Tonopah, Marmon.
 45279...Geo. W. Jordan, Tonopah, Ford.
 45280...Manhattan Con. Co., Manhattan, Ford.
 45281...C. C. Boak, Tonopah, Dodge.
 45282...C. C. Truett, Elko, Oldsmobile.
 45283...E. Gardner, Deeth, Ford.
 45284...Chris. Eshleman, Elko, Ford.
 45285...Pierce Voor, Elko, Ford.
 45286...Hoyt Mercantile Co., Lamoille, Dodge.
 45287...Hoyt Mercantile Co., Lamoille, Repub.
 45288...Steele Garage, Elko, Oldsmobile.
 45289...French Bakery Co., Elko, Ford.
 45290...W. A. Stinson, Elko, Chevrolet.
 45291...W. A. Stinson, Elko, Buick.
 45292...Barney Chicorp, Reno, Buick.
 45293...Lillian L. Breen, Reno, Cadillac.
 45294...Mrs. B. R. Addenbrooke, Reno, Stude.
 45295...Edw. Clayton, Reno, Buick.
 45296...G. S. Simpson, Reno, Studebaker.
 45297...Lees W. Taylor, Reno, Reno.
 45298...Mrs. Gertrude Craig, Lovelock, Buick.
 45299...Chas. Keith, Lovelock, Essex.
 45300...S. R. Warren, Elko, Maxwell.
 45301...Winne. Merc. Co., Winnemucca, Ford.
 45302...J. Sheehan, Winnemucca, Willys-K.
 45303...Henry Helbig, Rebel Creek, Ford.
 45304...A. Seeliger, Winnemucca, Ford.
 45305...Humboldt Soda Wks., Winnemucca, Ford.
 45306...Mrs. G. A. Becker, Winnemucca, Ford.
 45307...N. J. Rolph, Sulphur, Ford.
 45308...Mrs. James Marr, Winnemucca, Stude.
 45309...C. B. Brown Co., Winnemucca, Ford.
 45310...H. E. Clement, Orana, Cole.
 45311...Jos. H. Playter, Golconda, Ford.
 45312...Gol. T. & P. Co., Winnemucca, Stude.
 45313...Golconda T. & P. Co., Lovelock, Ford.
 45314...Roy Manor, Winnemucca, Studebaker.
 45315...Joe Baltzor, Winnemucca, Reno.
 45316...Minor C. Eastman, Winnemucca, Meta.
 45317...C. D. Brown, Winnemucca, Ford.
 45318...West End Con., Winnemucca, Oldsmo.
 45319...J. E. Southward, Winnemucca, Buick.
 45320...N. W. Kelly, Paradise, Ford.
 45321...Bohnert Bros., Winnemucca, Ford.
 45322...N. C. Johnson, Winnemucca, Oakland.
 45323...Phillip Egoscue, Winnemucca, Chevro.
 45324...J. E. Hearn, McDermitt, Ford.
 45325...School of Industry, Elko, Dodge.
 45326...O. C. Graetz, Mason, Michigan.
 45327...G. Nieri, Dayton, Dodge.
 45328...S. Imeli, Carson City, Buick.
 45329...Geo. W. Cowing, Carson City, Buick.
 45330...A. I. D'Arcy, Goldfield, Federal.
 45331...John J. Sullivan, Reno, Buick.
 45332...R. M. Parker, Reno, Ford.
 45333...Homestead Baking Co., Reno, Ford.
 45334...Homestead Baking Co., Reno, Ford.
 45335...Chas. S. Chandler, Ely, Franklin.
 45336...John Thomas, Fallon, Ford.
 45337...Harry M. Carter, Fallon, Maxwell.
 45338...Helga O'sen, Carson City, Ford.
 45339...Com-Phenix M. Co., Virginia, Pierce-A.
 45340...H. J. Anderson, Reno, Ford.
 45341...Elbert Phillips, Searchlight, Hupmo.
 45342...B. F. Berkley, Reno, Ford.
 45343...Carl C. Barnes, Reno, Hudson.
 45344...Mrs. Ed. Clawson, Reno, Ford.
 45345...O. P. Brown, Reno, Overland-Willys.
 45346...Mrs. Cordelia Foote, Gold Hill, Hupmo.
 45347...W. H. Roach, Sweetwater, Ford.
 45348...D. C. Jones, Sweetwater, Dodge.
 45349...H. A. Davison, East Ely, Chevrolet.
 45350...Standard Oil Co., Reno, Ford.
 45351...Standard Oil Co., Reno, Republic.
 45352...Oliver Iveson, Gerlach, Ford.
 45353...J. H. Heward, Gerlach, Ford.
 45354...T. J. Godfrey, Kimberly, Hudson.
 45355...Alfred Chartz, Carson, Lexington.
 45356...Mrs. Lem A'len, Reno, Ford.
 45357...Geo. Oliver, Elko, Dodge.
 45358...W. T. Tate, Las Vegas, Buick.
 45359...W. F. Wright, Las Vegas, Cole.
 45360...Earl Heath, Las Vegas, Ford.
 45361...Harold Vaughn, Carson, Overland.
 45362...Clarence Ruedy, Carson, Reno.
 45363...Clarence Ruedy, Carson, Ford.
 45364...E. G. Folsom, Carson, Maxwell.

- 45365...W. R. Toombs, Elko, Ford.
 45366...Domingo Marluich, Elko, Hudson.
 45367...Thos. Linehan, Goldfield, Ford.
 45368...J. D. Manyhouse, Goldfield, Ford.
 45369...K. A. Peterson, Reno, Ford.
 45370...Wm. S. Harrison, Overton, Ford.
 45371...L. J. Risley, Owyhee, Chevrolet.
 45372...George Hardman, Reno, Ford.
 45373...J. G. Terkla, Tonopah, Buick.
 45374...Al. Kelliker, Tonopah, Ford.
 45375...Shelton McClain, Tonopah, Dodge.
 45376...Dr. J. C. Cowden, Tonopah, Maxwell.
 45377...A. H. Crittenden, Tonopah, Ford.
 45378...Dave Coleman, Divide City, Dodge.
 45379...J. W. Clifford, Tonopah, Chalmers.
 45380...Howard F. Cameron, Reno, Ford.
 45381...John Zunino, Tonopah, Maxwell.
 45382...G. H. Baldwin, Tonopah, Ford.
 45383...John T. Blake, Tonopah, Ford.
 45384...Wm. R. Bozarth, Tonopah, Oakland.
 45385...E. S. Masters, Tonopah, Ford.
 45386...E. S. Masters, Tonopah, Peerless.
 45387...E. S. Masters, Tonopah, Studebaker.
 45388...T. S. Baker, Manhattan, Studebaker.
 45389...J. A. McDavid, Manhattan, Ford.
 45390...J. A. McDavid, Manhattan, Studebaker.
 45391...Geo. Wilson, Virginia, Ford.
 45392...W. R. Bollinger, Lee, Dodge.
 45393...G. Rossi, Lamolite, Dodge.
 45394...J. F. Baker, Elko, Dodge.
 45395...Eager Brothers, Parks Station, Dodge.
 45396...John Romono, Elko, Ford.
 45397...E. J. Caffery, Reno, Ford.
 45398...Ed. Miller, Carson City, Buick.
 45399...F. L. Wildes, Carson City, Buick.
 45400...W. B. Alexander, Reno, Chevrolet.
 45401...State Highway Dept., Carson, Nash.
 45402...State Highway Dept., Carson, Nash.
 45403...State Highway Dept., Carson, Kelly.
 45404...Con. Hauling & Cont. Co., Reno, Garf.
 45405...L. L. Patrick, Goldfield, Packard.
 45406...F. Phillip, Carlin, Ford.
 45407...Frank E. Crawford, Golconda, Ford.
 45408...R. E. Rockwell, Elko, Chevrolet.
 45409...J. E. Penrod, Elko, Ford.
 45410...Wendell M. Porter, Elko, Buick.
 45411...A. R. Canille, Elko, Buick.
 45412...H. W. Chenoweth, Elko, Maxwell.
 45413...Anton Lassen, Lovelock, Hupmobile.
 45414...A. E. Kibble, Reno, Maxwell.
 45415...Douglas Beasley, Lovelock, Chevrolet.
 45416...G. D. Grazer, Yerington, Hupmobile.
 45417...C. S. Munson, Currant, Ford.
 45418...Joe Raffetto, Carson City, Buick.
 45419...Mrs. J. H. Cahill, Austin, Chevrolet.
 45420...Hasbrouck Div. M. Co., Goldfield, Ford.
 45421...W. J. Wholey, Austin, Ford.
 45422...L. B. Spencer, Mina, Oakland.
 45423...L. B. Spencer, Mina, Ford.
 45424...James Passno, Las Vegas, Ford.
 45425...Jess Sites, Las Vegas, Ford.
 45426...Miss E. Dooley, Goldfield, Ford.
 45427...Miss E. Dooley, Goldfield, Ford.
 45428...W. W. Wibson, Searchlight, Vim.
 45429...Harry H. Rose, Fallon, Ford.
 45430...Wm. M. Fuller, Reno, Chevrolet.
 45431...M. Arnold, Goldfield, Ford.
 45432...Lemaire & Sons, Battle Mtn., Pierce-A.
 45433...A. C. Lemaire, Battle Mtn., Pierce-A.
 45434...Lester Jurey, Battle Mtn., Ford.
 45435...L. O. Chase, Battle Mtn., Dodge.
 45436...S. B. Elbert, East Ely, Franklin.
 45437...S. B. Elbert, East Ely, Thomas.
 45438...Q. D. Boyd, Halleck, Ford.
 45439...Q. D. Boyd, Halleck, Ford.
 45440...George Rowe, Contact, Ford.
 45441...Frank L. Sellstrom, Pioche, Republic.
 45442...David Francis, Ursine, Ford.
 45443...Bruce Steward, Vya, Oakland.
 45444...Howard Apostegin, Golconda, Overland.
 45445...Madison Anderson, Golconda, Buick.
 45446...Geo. A. Sowers, Ely, Dodge.
 45447...Matt Benson, Kimberly, Ford.
 45448...L. H. Huren, Kimberly, Ford.
 45449...G. W. Weller, Ely, Dodge.
 45450...P. M. Baker, Baker, Hupmobile.
 45451...Geo. T. Baker, Baker, Reno.
 45452...George Golden, Omco, Dodge.
 45453...W. B. Seitz, Millers, Ford.
 45454...C. R. Morris, Virginia, Buick.
 45455...W. B. Yonkin, Millers, Ford.
 45456...Mrs. Ida Cleveland, Schurz, Chevrolet.
 45457...Harry McMahsters, Schurz, Chevrolet.
 45458...Tom H. Sanford, Fallon, Chevrolet.
 45459...John Huttman, Fallon, Ford.
 45460...Frank W. Clinton, Fallon, Ford.
 45461...W. F. Shaw, Fallon, Ford.
 45462...Churchill Farm Bureau, Fallon, Ford.
 45463...Mrs. A. Fuller, Hawthorne, Dodge.
 45464...J. A. McCarthy, Hawthorne, Ford.
 45465...Herman Heunader, Reno, Ford.
 45466...C. Hogue, Reno, Buick.
 45467...Frank Cantion, Sparks, Hudson.
 45468...S. Parlanti, Reno, Mitchell.
 45469...F. Gori, Sparks, Studebaker.
 45470...Geo. Yamasaki, Sparks, Chevrolet.
 45471...Jake Wainwright, Reno, Chevrolet.
 45472...W. E. Watson, Reno, Buick.
 45473...W. C. Bradshaw, Paradise, Maxwell.
 45474...Hodges Cook Merc. Co., Pioche, Ford.
 45475...Wm. H. Pitts, Pioche, Buick.
 45476...Hodges Cook Merc. Co., Pioche, Smith.
 45477...E. Erickson, Verdi, Buick.
 45478...Mrs. H. B. Hoohs, Reno, Ford.
 45479...Nevada T. & T. Co., Goldfield, Ford.
 45480...J. L. McWilliams, Reno, Reno.
 45481...John Rapoga, Reno, Ford.
 45482...J. E. Hughes & Son, Mesquite, Repub.
 45483...Mrs. J. L. Sheldon, Reno, Chevrolet.
 45484...Hobart Est. Co., Lovelock, Buick.
 45485...A. John, Lovelock, Cadillac.
 45486...Ernest Murphy, Eagleville, Ford.
 45487...Frank Wheeler, Reno, Chevrolet.
 45488...H. Leter, Fallon, Ford.
 45489...W. H. Yareo, Fallon, Ford.
 45490...J. S. Wiggins, Reno, Ford.
 45491...C. W. Hyatt, Reno, Ford.
 45492...Carl J. Lockwood, Reno, Ford.
 45493...Emil Weichert, Reno, Ford.
 45494...Daniel Woo, Reno, Ford.
 45495...C. Theusen, Verdi, Ford.
 45496...John A. Egger, Goodsprings, Ford.
 45497...Leon T. Cirac, Stillwater, Ford.
 45498...Lorenzi & Jones, Las Vegas, Ford.
 45499...G. A. Neilson, Steamboat, Ford.
 45500...Clark & Mendire, Battle Mtn., Ford.
 45501...Dr. S. R. Clark, Battle Mtn., Ford.
 45502...T. F. Plummer, Eureka, Dodge.
 45503...Minerva T. Corp., Pioche, Hupmobile.
 45504...Jacob Buscher, Caliente, Ford.
 45505...T. H. Lever, Mason, Hup.
 45506...C. A. Tyler, Las Vegas, Ford.
 45507...E. H. Clark, Reno, Buick.
 45508...Chas. S. Knight, Reno, Overland.
 45509...Star Taxi Co., Reno, Oakland.
 45510...Star Taxi Co., Reno, Oakland.
 45511...Star Taxi Co., Reno, Oakland.
 45512...Star Taxi Co., Reno, Oakland.
 45513...Frank Ranch & C. Co., Reno, Ford.
 45514...S. Jacobs, Reno, Overland.
 45515...A. T. Bauman, Fallon, Dort.
 45516...Harlon Adamson, Fallon, Ford.
 45517...Vince Vertichio, Yerington, Ford.
 45518...C. E. Mack, Reno, Hudson.
 45519...C. Smoot, Carson City, Chevrolet.
 45520...D. Bohall, Carson City, Overland.
 45521...George E. Cox, Birch, Ford.
 45522...Will Huebener, Eureka, Ford.
 45523...Robert E. Scott, Platora, Ford.
 45524...Cyril S. Wenger, Las Vegas, Hup.
 45525...C. E. Kelly, Gerlach, Overland.
 45526...Chas. Williams, Congress, Ariz., Ford.
 45527...W. H. Brockbank, Reno, Oldsmobile.
 45528...K. E. Hurtbise, Reno, Ford.
 45529...W. R. Calver, Gold Hill, Ford.
 45530...F. A. Arents, Simpson, Dodge.
 45531...H. Francisco, Yerington, Ford.
 45532...Tusto Bengoeue, Wellington, Ford.
 45533...Union Con. M. Co., Virginia, Cadillac.
 45534...Wm. Fulle, Montello, Overland.
 45535...C. Escallier, Reno, Chevrolet.
 45536...V. A. Westfall, Lovelock, Reno.
 45537...Geo. W. Box, Tonopah, White.
 45538...Geo. W. Box, Tonopah, Ford.

- 45529...Henry Fischer, Lamolile, Ford.
 45540...Neil Carmichael, Lovelock, Dodge.
 45541...R. C. Trudgen, Tonopah, Ford.
 45542...Jay Smith, Tonopah, Hupmobile.
 45543...Hugh Sutherland, Tonopah, Buick.
 45544...F. E. Brockliass, Gardnerville, Ford.
 45545...E. J. Phillips, Gardnerville, Overland.
 45546...Fred Brenzel, Gardnerville, Buick.
 45547...Geo. Oka, Gardnerville, Chevrolet.
 45548...Farmers T. & T. Co., Gardnerville, Fd.
 45549...Mrs. A. Helwink, Gardnerville, Jack.
 45550...Geo. Hoffman, Gardnerville, Ford.
 45551...Fred Allerman, Gardnerville, Dodge.
 45552...Rev. T. M. Tubman, Reno, Studebaker.
 45553...C. H. Eulerson, Reno, Dodge.
 45554...Geo. McCracken, Carson, Overland.
 45555...L. Sauer, Washoe, Cole.
 45556...Geo. B. Thatcher, Reno, Cadillac.
 45557...L. D. Ray, Sparks, Ford.
 45558...Mrs. T. Ferguson, Tonkin, Chevrolet.
 45559...W. H. Barton, Tonopah, Ford.
 45560...J. D. Jefferson, Tonopah, Auburn.
 45561...Robt. C. Mayes, Tonopah, Ford.
 45562...T. J. Antoniazzi, Tonopah, Ford.
 45563...A. G. Noyes, Round Mtn., Ford.
 45564...A. W. Baker, Round Mtn., Ford.
 45565...W. E. Davis, Tonopah, Ford.
 45566...P. O. Ohslund, Tonopah, Ford.
 45567...P. Lera, Elko, Overland.
 45568...Campton Com. Co., Ely, Republic.
 45569...Campton Com. Co., Ely, Republic.
 45570...Fred T. West, Ely, Dodge.
 45571...Campton Com. Co., Ely, Ford.
 45572...Campton Com. Co., Ely, Ford.
 45573...Campton Com. Co., Ely, Republic.
 45574...Geo. M. Campbell, Steptoe, Case.
 45575...C. P. Jensen, Ely, Studebaker.
 45576...Frank Walsh, Tonopah, Ford.
 45577...W. M. Farris, Tonopah, Dodge.
 45578...R. H. Crump, Tonopah, Anhut.
 45579...Adolph Miller, Tonopah, Ford.
 45580...Paul Fischer, Arrowhead, Ford.
 45581...Pete Giovannola, Tonopah, Ford.
 45582...C. J. Berry, Midas, Republic.
 45583...Webster Patterson, Lamolile, Ford.
 45584...Webster Patterson, Lamolile, Chevrolet.
 45585...Pete Golcoches, Elko, Oldsmobile.
 45586...Lee Hylton, Lee, Oldsmobile.
 45587...Mrs. James Green, Elko, Oakland.
 45588...E. P. McLean, Fallon, Hollier.
 45589...L. A. Buckstead, Fallon, King.
 45590...N. J. Johnson, Fallon, Ford.
 45591...Bery P. Casey, Fallon, Ford.
 45592...H. C. Power, Fallon, Saxon.
 45593...Jay H. Clemons, Reno, Buick.
 45594...W. C. Wilson, Reno, Overland.
 45595...W. Morois, Minden, Buick.
 45596...E. W. Gendron, Fallon, Chevrolet.
 45597...M. E. Sanford, Fallon, Chevrolet.
 45598...B. F. Day, Fallon, Buick.
 45599...R. L. Thomas, Fallon, Chevrolet.
 45600...F. E. Ludwick, Fallon, Chevrolet.
 45601...W. J. Gerrey, Virginia, Overland.
 45602...John R. Tullis, Imlay, Ford.
 45603...E. H. Whitacre, Yerington, Ford.
 45604...A. L. Smith, Carson City, Ford.
 45605...Frank Bussio, Reno, Oakland.
 45606...Rosette Divide M. Co., Tonopah, Repub.
 45607...L. Mohnari, Reno, Oakland.
 45608...R. L. Kimmel, Reno, Overland.
 45609...A. I. D'Arcy, Goldfield, Dodge.
 45610...E. LeCuyer, Verdi, Buick.
 45611...Louie Avinsino, Reno, Oakland.
 45612...H. S. Munroe, Kimberly, Cadillac.
 45613...R. E. Wilson, Reno, Chevrolet.
 45614...John P. Jones, Reno, Maxwell.
 45615...Clyde E. Warren, Reno, Studebaker.
 45616...L. A. Breedine, Las Vegas, Chevrolet.
 45617...Mrs. T. J. Reilly, East Ely, Overland.
 45618...W. H. Williams, Fallon, Hudson.
 45619...A. E. Stevens, Fallon, Ford.
 45620...Otto Machin, Fallon, Ford.
 45621...Steptoe Livestock Co., Currie, Ford.
 45622...H. E. Andrews, Fallon, Ford.
 45623...Edward P. Sullivan, Virginia, Reo.
 45624...L. H. Wagner, Elko, Ford.
 45625...E. R. Richardson, Manhattan, Ford.
 45626...Matt T. Kane, Manhattan, Studebaker.
 45627...C. H. Blanchard, Reno, Chevrolet.
 45628...A. E. Boggs, Rawhide, Ford.
 45629...Leonard Fritz, Mina, Oakland.
 45630...Arthur A. Primeaux, Midas, Nash.
 45631...Arthur A. Primeaux, Midas, Packard.
 45632...Arthur A. Primeaux, Midas, Overland.
 45633...G. N. Fish, Yerington, Ford.
 45634...G. Prato, Reno, Ford.
 45635...W. F. Collins, Battle Mtn., Ford.
 45636...Mrs. W. St. Pierre, Reno, Dort.
 45637...Mrs. H. J. Hughes, Gerlach, Chevrolet.
 45638...Newton W. Jacobs, Reno, Buick.
 45639...Buena Vista Del Oro M. Co., Reno, Ford.
 45640...C. B. Newcombe, Yerington, Overland.
 45641...John Wright, Yerington, Ford.
 45642...Joseph Grusa, Jr., Silver City, Dodge.
 45643...A. L. Lidwell, Pioneer, Ford.
 45644...A. L. Lidwell, Pioneer, Ford.
 45645...Parvin Jones, Carson City, Ford.
 45646...Thos. F. Minor, Platora, Reo.
 45647...G. Simi, Reno, Ford.
 45648...C. C. Ohl, Reno, Dodge.
 45649...George K. Ramsey, Reno, Saxon.
 45650...P. J. Haynes, Winnemucca, Ford.
 45651...Samuel Rowe, Arden, Dodge.
 45652...Thos. S. Guinon, Contact, Ford.
 45653...Fred Schenkel, Tonopah, Ford.
 45654...J. N. Reimers, Round Mtn., Ford.
 45655...John O'Keefe, Goldfield, Ford.
 45656...Perry White, Tonopah, Ford.
 45657...Divide Extension Co., Divide, Ford.
 45658...Sarah E. Clark, Tonopah, Overland.
 45659...Chas. Reich, Tonopah, Ford.
 45660...Gus Wallberg, Tonopah, Ford.
 45661...J. O. Kemple, Goodsprings, Overland.
 45662...W. Frank Goodner, Reno, Monroe.
 45663...H. E. Stranex, Ely, Studebaker.
 45664...R. Mountjoy, Ely, Ford.
 45665...Con. Coppermines Co., Kimberly, Ford.
 45666...Con. Coppermines Co., Kimberly, Dodge.
 45667...E. P. Bihlmaier, Elko, Nash.
 45668...Ollie Day, Elko, Oldsmobile.
 45669...Nevada Vulcanizing Works, Elko, Hup.
 45670...John Howells, Halleck, Dodge.
 45671...Felex Plaza, White Rock, Studebaker.
 45672...Hankins Estate, Lamolile, Paige.
 45673...L. M. Bellinger, Lamolile, Oakland.
 45674...Chas. Westlund, Lamolile, Ford.
 45675...W. A. Huntley, Tuscarora, Ford.
 45676...M. H. Reynolds, Elko, Overland.
 45677...E. S. Bates, Reno, Overland.
 45678...Chris. Nielsen, Minden, Velie.
 45679...C. B. Elderkin, Reno, Haynes.
 45680...Oliver E. Smith, Reno, Buick.
 45681...P. V. Knowles, Reno, Ford.
 45682...P. E. Cota, Reno, Ford.
 45683...Rodger Fenton, Lovelock, Ford.
 45684...Tony Johnson, Lovelock, Ford.
 45685...Silver Dyke & Tunz Co., Mina, Chevro.
 45686...Arizona Silver M. Co., Unionville, Ford.
 45687...H. W. Huskey, Reno, Hudson.
 45688...P. J. Salmon, Rawhide, Ford.
 45689...Julian Anderson, Las Vegas, Perkins.
 45690...W. L. E. Brown, Mason, Maxwell.
 45691...A. H. Read, Arden, Ford.
 45692...A. J. Tedder, Mason, Cadillac.
 45693...Chas. Kenifake, Mina, Ford.
 45694...Byron S. Wilson, Manhattan, Ford.
 45695...W. R. Wilcox, Manhattan, Ford.
 45696...L. Ravera, Reno, Overland.
 45697...Southern Pacific Co., Sparks, Ford.
 45698...G. B. Stannard, Hawthorne, Ford.
 45699...A. Ruckteschler, Winnemucca, Ford.
 45700...A. Ruckteschler, Winnemucca, Ford.
 45701...C. E. Weikel, Winnemucca, Jeffery.
 45702...L. F. McGrath, Winnemucca, Studebkr.
 45703...Johnson & Becker, Winnemucca, GMC.
 45704...Al. Slinger, Winnemucca, Ford.
 45705...Oscar Reinhart, Winnemucca, Mitchell.
 45706...W. G. Adamson, Winnemucca, Cadillac.
 45707...Modesto Mayayo Co., Denio, Ore., Olds.
 45708...L. G. Campbell, Winnemucca, Dodge.
 45709...Reinhart L. Co., Winnemucca, Dodge.
 45710...G. A. Allerman, Gardnerville, Ford.
 45711...John H. Anderson, Reno, Reo.
 45712...Jas. L. Smith, Gold Hill, Maxwell.

- 45713...Troy Laundry, Elko, Ford.
 45714...H. J. Elges, Gardnerville, Buick.
 45715...H. J. Elges, Gardnerville, Ford.
 45716...D. E. Hill, Beulah, Oldsmobile.
 45717...O. G. Dierscher, Beulah, Ford.
 45718...R. A. Marton, Fallon, Ford.
 45719...Fred Serval, Reno, Buick.
 45720...G. G. Fisk, Fallon, Ford.
 45721...C. E. Fiske, Fallon, Chevrolet.
 45722...Pete Achurra, Elko, Ford.
 45723...Frank Gorman, Elko, Dodge.
 45724...Chas. Nuckols, Elko, Dodge.
 45725...Hylton & Clayton, Elko, Republic.
 45726...Hylton & Clayton, Elko, Dodge.
 45727...Hylton & Clayton, Elko, Dodge.
 45728...Russell Campbell, Jiggs, Dodge.
 45729...Charles A. Price, Fallon, Ford.
 45730...Chas. E. Glazier, Fallon, Essex.
 45731...Andrew Johnson, Fallon, Chevrolet.
 45732...W. H. Yoder, Fallon, Ford.
 45733...Mrs. Paul Veter, Elko, Overland.
 45734...Emilie Dotta, Elko, Studebaker.
 45735...A. J. Twilegar, Goldfield, Ford.
 45736...R. Tomasi, Goldfield, Maxwell.
 45737...A. B. Dickerson, Smith, Dodge.
 45738...Anderson Bros., Gardnerville, Buick.
 45739...Leo Springmeyer, Gardnerville, Kleiber.
 45740...Peter Krummes, Gardnerville, Ford.
 45741...W. A. Pursel, Yerington, Ford.
 45742...Chas. E. McLeod, Millett, Buick.
 45743...B. Ricci, Dayton, Buick.
 45744...Sam Homi, Round Mtn., Maxwell.
 45745...Ben Bianchi, Yerington, Studebaker.
 45746...Frank J. Mathews, Yerington, Overland.
 45747...W. A. Pray, Fernley, Ford.
 45748...H. N. Anderson, Las Vegas, Ford.
 45749...J. Klinger, Tonopah, Buick.
 45750...E. Sullivan, McDermitt, Buick.
 45751...Geo. Cris, Larson, Reno, Ford.
 45752...Max Cohen, Reno, Ford.
 45753...R. H. Cameron, Reno, Ford.
 45754...Clarence V. Edmonds, Reno, Overland.
 45755...Irene M. Wischmann, Reno, Dodge.
 45756...Benetti Bros., Sparks, Ford.
 45757...A. Bennetti, Sparks, Ford.
 45758...Edgar Dance, Golconda, Chevrolet.
 45759...H. S. McLeod, Reno, Overland.
 45760...Corico Bros., Reno, Chalmers.
 45761...Mrs. J. S. Mitchell, Reno, Buick.
 45762...E. Johnson, Dayton, Overland.
 45763...Chas. E. Noble, Mina, Chevrolet.
 45764...M. M. Harcourt, Millers, Grant.
 45765...Ralph T. Salt, Caliente, Chandler.
 45766...Frank Morrison, Las Vegas, Overland.
 45767...J. S. Amsden, Pioche, Paige-Detroit.
 45768...Lloyd R. Ginter, McGill, Ford.
 45769...C. F. Shipp, Jr., Shoshone, Ford.
 45770...Wallace G. Lee, Battle Mtn., Ford.
 45771...T. W. Swindlehurst, Battle Mtn., Ford.
 45772...Geo. Keough, Lone, Franklin.
 45773...Gus. Vuccanelli, Elko, Ford.
 45774...Ralph Schmidt, Tuscarora, Dodge.
 45775...C. D. Lamar, Tuscarora, Saxon.
 45776...Elko Water Works, Elko, Lippard-S.
 45777...Vecinte Juaristi, Lee, Studebaker.
 45778...Pete Corta, Elko, Dorris.
 45779...E. G. Timm, Elko, Overland.
 45780...M. B. Cross, Elko, Ford.
 45781...J. H. Hennen, Lamaille, Studebaker.
 45782...E. M. McDermott, Lamaille, Ford.
 45783...Bertha Knemeyer, Metropolis, Dodge.
 45784...Milton B. Badt, Elko, National.
 45785...F. M. Wightman, Fallon, Dodge.
 45786...S. L. Rozantini, Duckwater, Ford.
 45787...Geo. H. Allen, Tonopah, Chevrolet.
 45788...D. C. Ryckman, Tonopah, Maxwell.
 45789...Brown & Nelson, Montgomery, Ford.
 45790...R. B. Cowan, Luning, Ford.
 45791...E. N. Mitchell, Caliente, Ford.
 45792...A. S. Gaines, Searchlight, Stearns-K.
 45793...C. M. Crowley, Searchlight, Ford.
 45794...S. Burnette, Fallon, Chevrolet.
 45795...A. F. Branch, Fallon, Chevrolet.
 45796...A. F. Branch, Fallon, Buick.
 45797...Louis A. Jensen, Lovelock, Ford.
 45798...J. W. Cody, Midas, Reo.
 45799...Thos. Major, Golconda, Cadillac.
 45800...M. P. Doonan, Midas, Dodge.
 45801...P. R. Rohan, Carson City, Stephens.
 45802...John Harry, Round Mtn., Ford.
 45803...Jas. A. Bishop, Reno, Chandler.
 45804...John Bindshader, Tonopah, Ford.
 45805...Elko Music Co., Elko, Chevrolet.
 45806...Harry Platt, Reno, Dodge.
 45807...E. L. Goodwin, Arthur, Franklin.
 45808...J. M. Heaton, Las Vegas, Ford.
 45809...Albert J. Raymond, Pioche, Ford.
 45810...D. A. Turner, Tonopah, Chandler.
 45811...L. F. Clair, Manhattan, Ford.
 45812...M. Kishida, Montello, Ford.
 45813...W. S. Cropper, Jr., Arden, Ford.
 45814...Fred Reim, Goodsprings, Ford.
 45815...I. D. Gregg, Deeth, Ford.
 45816...M. F. Jukes, Elko, Essex.
 45817...J. J. Hylton, Jiggs, Buick.
 45818...Frank Frazier, Manhattan, Ford.
 45819...Ed. Hursh, Fallon, Ford.
 45820...R. A. Carroll, Reno, Ford.
 45821...O. L. Davis, Atwood, Ford.
 45822...Mike Landreth, Montello, Ford.
 45823...Geo. N. Dieringer, Austin, Ford.
 45824...Ernest Dressler, Sheridan, Ford.
 45825...F. E. Dressler, Sheridan, Studebaker.
 45826...A. C. McMullen, Mina, Partin-Palmer.
 45827...R. C. Miller, Mina, Ford.
 45828...John Cachonant, Luning, Buick.
 45829...Ralph Leland, Minden, Buick.
 45830...Mrs. Sam Platt, Reno, Dodge.
 45831...Washoe County, Reno, Ford.
 45832...J. A. Enkson, Reno, Overland.
 45833...Geo. K. Cremer, Reno, Oakland.
 45834...C. E. Jones, Carson City, Ford.
 45835...J. A. Hamble, Gerlach, Oldsmobile.
 45836...J. D. Mariner, Reno, Dort.
 45837...Leita A. Knouse, Reno, Pope-Hartford.
 45838...C. C. Wortley, Reno, Overland.
 45839...M. D. Moore, Gerlach, Ford.
 45840...Geo. Winburn, Reno, Dodge.
 45841...Renato Allegrini, Reno, Ford.
 45842...A. J. Cross, Reno, Ford.
 45843...Geo. A. Peckham, Reno, Cadillac.
 45844...L. E. Scott, Reno, Cadillac.
 45845...F. L. Padgett, Kimberly, Ford.
 45846...Geo. A. Bain, Golconda, Reo.
 45847...M. Basta, Kimberly, Jordan.
 45848...C. E. Bias, McGill, Chevrolet.
 45849...Boundy Bros., Schellbourne, Reo.
 45850...Chris. Jensen, Preston, Oldsmobile.
 45851...James Rosevear, Ruth, Ford.
 45852...A. Maracini, Kimberly, National.
 45853...White Pine County, Ely, Hudson.
 45854...Thos. F. Minor, Imlay, Cadillac.
 45855...Mrs. Kate Gage, Smith, Ford.
 45856...Wm. Matthews, Yerington, Ford.
 45857...Daniel E. Poll, Wichman, Ford.
 45858...A. C. Fultone, Wellington, Ford.
 45859...E. G. Reynolds, Currie, Ford.
 45860...Thos. Boofor, Currie, Ford.
 45861...W. J. Mahoney, Beowawe, Dodge.
 45862...L. J. Edwards, Manhattan, Chevrolet.
 45863...Joe Albright, Elko, Ford.
 45864...A. Gallotti, Reno, Ford.
 45865...Fred Oliva, Reno, Ford.
 45866...E. L. Ware, Reno, Ford.
 45867...N. Bulasosky, Reno, Ford.
 45868...James O'Connell, Reno, Ford.
 45869...Bud Marlett, Goldfield, Ford.
 45870...Wm. Bevan, Goldfield, Maxwell.
 45871...R. Nenzel, Lovelock, Overland.
 45872...J. D. Wright, Tonopah, Ford.
 45873...W. T. Snidow, Tonopah, Buick.
 45874...Robert Shields, Tonopah, Ford.
 45875...O. E. Nordahl, Tonopah, Briscoe.
 45876...J. W. Mohatt, Lovelock, Chevrolet.
 45877...E. C. Riddell, Deeth, Ford.
 45878...David Samuels, Battle Mtn., Ford.
 45879...E. J. Bews, Wells, Dodge.
 45880...Mineral Mtn., M. Co., Tecoma, Ford.
 45881...Philip Anker, Lovelock, Ford.
 45882...May E. Cunningham, Tonopah, Max.
 45883...C. E. Noble, Elko, Studebaker.
 45884...Henry Krenka, Arthur, Studebaker.
 45885...Thos. Toyne, Jiggs, Dodge.
 45886...Oscar Bridgeman, Reno, Chalmers.

- 45887...R. Millerkin, Goodsprings, Case.
 45888...Consumers Mutual Union, Reno, Ford.
 45889...E. L. Burney, Austin, Reo.
 45890...Geo. S. Spreyer, Fallon, Studebaker.
 45891...W. G. Allum, Yerington, Ford.
 45892...A. A. Douglass, Smith, Ford.
 45893...S. J. Spinger, Simpson, Ford.
 45894...Norman Dickson, Smith, Ford.
 45895...A. G. Jones, Simpson, Ford.
 45896...A. F. Gegan, Reno, Haynes.
 45897...W. G. Box, Sr., Hawthorne, Cadillac.
 45898...H. B. Millard, Carson City, Chevrolet.
 45899...Lloyd Fitzgerald, Carlin, Ford.
 45900...Leland L. Wright, Carlin, Dodge.
 45901...Frankie Byrnes, Paradise, Ford.
 45902...C. L. Noble, Fallon, Ford.
 45903...J. A. Caughlin, Silver Peak, Ford.
 45904...W. B. Young, Dyer, Dodge.
 45905...Harry Warren, Wabaska, Ford.
 45906...Harry Warren, Wabaska, Ford.
 45907...Union Honey Co., Wabaska, Ford.
 45908...Wm. Kane, Wells, Ford.
 45909...Union Honey Co., Wabaska, Ford.
 45910...Union Honey Co., Wabaska, Ford.
 45911...Union Honey Co., Wabaska, Ford.
 45912...Union Honey Co., Wabaska, Ford.
 45913...Allen F. Dunbar, Ft. Churchill, Buick.
 45914...Roy Felt, Overton, Ford.
 45915...Frank D. Hawn, Las Vegas, Buick.
 45916...Luning Con. Mines, Tonopah, Bethlm.
 45917...Geo. Coslett, Tonopah, Ford.
 45918...W. L. Chisholm, Tonopah, Ford.
 45919...Will O. Bay, Reno, Oldsmobile.
 45920...W. H. Jones, Reno, Overland.
 45921...Guy M. Blair, Elko, Ford.
 45922...C. McClure, Fallon, Dodge.
 45923...Sam J. Taylor, Wonder, Ford.
 45924...A. A. Lowe, Fallon, Hupmobile.
 45925...Wheeler Livestock Co., Reno, Ford.
 45926...G. B. Stannard, Hawthorne, Hupmo.
 45927...Willis W. Caffrey, Reno, Ford.
 45928...Julia E. Davisson, Las Vegas, Dodge.
 45929...F. M. Bybee, Overton, Franklin.
 45930...Nevada Lime & Rock Co., Ehret, Ford.
 45931...Nevada Lime & Rock Co., Ehret, Ford.
 45932...R. Pengelly, Wells, Ford.
 45933...L. H. Gibbs, Metropolis, Dodge.
 45934...Nick Williams, Ely, Ford.
 45935...H. H. Stevenson, Ely, Maxwell.
 45936...J. M. Slopansky, Ruth, Reo.
 45937...Jos. B. Nay, Belmont, Studebaker.
 45938...M. Lebecque, Belmont, Cutting.
 45939...John Zuech, Goldfield, Ford.
 45940...Lookout Divide M. Co., Tonopah, Ford.
 45941...J. Roy Bradshaw, Paradise, Ford.
 45942...F. E. Laurenden, Yerington, Buick.
 45943...Arthur A. Gintel, Reno, Ford.
 45944...H. G. Mason, Reno, Ford.
 45945...A. Berilaegna, Reno, Ford.
 45946...Jane Sutherland, Fallon, Ford.
 45947...Herman Thran, Jr., Lovelock, Ford.
 45948...Ed. Vachina, Reno, Chevrolet.
 45949...Rees Jenkins, Reno, Reo.
 45950...H. C. Douglas, Reno, Reo.
 45951...D. B. Frandsey, Reno, Chevrolet.
 45952...Carrie F. Brown, Reno, Chevrolet.
 45953...H. E. Tait, Reno, Reo.
 45954...J. B. Luchetti, Reno, Oakland.
 45955...Jack Dolf, Fallon, Chevrolet.
 45956...Antone Damele, Tonkin, Ford.
 45957...Steven Damele, Tonkin, Ford.
 45958...V. E. Hicks, Eureka, Ford.
 45959...Nostrass Bros., Eureka, Metz.
 45960...J. B. Venturino, Eureka, Hudson.
 45961...B. A. Hanks, Contact, Hupmobile.
 45962...J. David Weeks, Wells, Dodge.
 45963...B. L. Gretton, Reno, Ford.
 45964...J. C. Post, Tonopah, Ford.
 45965...Clark James, Tonopah, Studebaker.
 45966...J. C. Boyle, Reno, Buick.
 45967...Jos. P. Farrell, Tonopah, Ford.
 45968...Mrs. Minnie Byrne, Fallon, Ford.
 45969...Domingo Uhalde, Eureka, Dodge.
 45970...E. E. Lutta, Ruby Valley, Stuts.
 45971...A. A. Codd, Reno, Reo.
 45972...Clara A. Boerlin, Hawthorne, Reo.
 45973...Perry G. Morgan, Wichman, Dodge.
 45974...Henry Boerlin, Hawthorne, Garford.
 45975...A. H. Barlow, Mason, Ford.
 45976...Mrs. A. L. Swanback, Yerington, Ford.
 45977...J. H. Cairns, Yerington, Ford.
 45978...L. Masini, Yerington, Hupmobile.
 45979...C. E. Hillygus, Yerington, Ford.
 45980...Larne & Son, Yerington, Ford.
 45981...F. W. Schanbeck, Reno, Buick.
 45982...A. J. Vincent, Reno, Lozier.
 45983...Ernest Steinbrenner, Reno, Buick.
 45984...W. F. Roseberry, Tuscarora, Chevrolet.
 45985...Garat & Co., White Rock, Ford.
 45986...Garat & Co., White Rock, Hudson.
 45987...J. G. Hankins, Jiggs, Chevrolet.
 45988...Wright Bros., Elko, Ford.
 45989...Wright Bros., Elko, Ford.
 45990...Jno. J. Hunter, Elko, Oldsmobile.
 45991...M. F. Martin, Austin, Oldsmobile.
 45992...D. P. Maestretti, Austin, Oakland.
 45993...W. Dunston, Austin, Ford.
 45994...Chas. Tanaka, McGill, Dodge.
 45995...Mrs. Geo. Hunter, Elko, Franklin.
 45996...R. F. Guley, Metropolis, Buick.
 45997...Beowawe Merc. Co., Beowawe, Ford.
 45998...F. E. Leonard, Beowawe, Dodge.
 45999...M. H. Bertrand, Beowawe, Maxwell.
 46000...Russell Dagz, McGill, Ford.
 46001...B. W. Coleman, Carson City, Overland.
 46002...J. E. Robbins, Elko, Dodge.
 46003...J. C. Woodward, Tuscarora, Chevrolet.
 46004...George M. Senter, Caliente, Republic.
 46005...J. H. Reeve, Dyer, Ford.
 46006...Ed. E. Brown, Fallon, Ford.
 46007...Henry Heavrin, Fallon, Ford.
 46008...W. L. Guinn, Reno, Hudson.
 46009...E. A. Quill, Carson City, Chevrolet.
 46010...H. E. Hillygus, Carson City, Dodge.
 46011...Highway Dept., Carson City, Ford.
 46012...Highway Dept., Carson City, Nash.
 46013...Highway Dept., Carson City, Nash.
 46014...Highway Dept., Carson City, Nash.
 46015...Highway Dept., Carson City, Nash.
 46016...Highway Dept., Carson City, Nash.
 46017...Print Leverich, Yerington, Ford.
 46018...Henry Rabe, Carson City, Ford.
 46019...C. Krummes, Gardnerville, Lorraine.
 46020...Geo. A. Richardson, Carson City, Ford.
 46021...E. E. Dryer, Beatty, Ford.
 46022...W. H. Allured, Jr., Searchlight, Pierce.
 46023...Elizabeth McKay, Yerington, Ford.
 46024...A. J. Taylor, Reno, Ford.
 46025...J. J. Brockliss, Gardnerville, Case.
 46026...Carl Heitman, Gardnerville, Ford.
 46027...P. J. Hickey, Gardnerville, Buick.
 46028...H. F. Dangberg, Minden, Ford.
 46029...H. F. Baker, Gardnerville, Ford.
 46030...Minden Butter Co., Minden, Ford.
 46031...H. Lionberger, Fallon, Chevrolet.
 46032...Willie Green, Lamolille, Maxwell.
 46033...Bower Bros., Lamolille, Ford.
 46034...Bower Bros., Lamolille, Ford.
 46035...J. W. Malloy, Hawthorne, Hupmobile.
 46036...Carlo Scatena, Yerington, Ford.
 46037...Henry Fallon, Fallon, Ford.
 46038...Theo. Tomamichel, Reno, Ford.
 46039...C. A. Eisenmenger, Reno, Buick.
 46040...G. W. Friedhoff, Yerington, Ford.
 46041...G. W. Friedhoff, Yerington, Ford.
 46042...F. L. Mason, Fallon, Ford.
 46043...Ernest Beel, Tippet, Ford.
 46044...C. H. Kramer, Fallon, Chevrolet.
 46045...Union Land & Cattle Co., Reno, Ford.
 46046...Walter Shores, Reno, Ford.
 46047...W. A. Brown, Reno, Ford.
 46048...F. A. Nolan, Eagleville, Ford.
 46049...Roy D. Gilbert, Reno, Ford.
 46050...H. F. Linnecke, Reno, Ford.
 46051...Howard Nelson, Reno, Ford.
 46052...W. J. Hendry, McGill, Ford.
 46053...George S. Just, Ely, Chevrolet.
 46054...R. G. Hart, Ely, Ford.
 46055...Carlyle Smith, McGill, Ford.
 46056...Wm. Holder, Kimberly, Reo.
 46057...Jas. R. Lowney, Luning, Reo.
 46058...Ed. Fulstone, Wellington, Ford.
 46059...Jas. Lancaster, Yerington, Ford.
 46060...J. W. Huntsman, Overton, Ford.

- 46061....C. E. Peterson, Beowawe, Ford.
 46062....H. T. Graves, Fernley, Chevrolet.
 46063....F. E. Glass, Reno, Nash.
 46064....Albert T. Carlson, Sparks, Abbot-Det.
 46065....Clyde W. Lang, Elko, Chevrolet.
 46066....A. G. Short, Ruby Valley, Dodge.
 46067....H. M. Short, Ruby Valley, Oldsmobile.
 46068....C. Skinner, Currie, Ford.
 46069....Wm. Hallahan, Tonopah, Ford.
 46070....A. M. Delmue, Pioche, Hupmobile.
 46071....Chris. Dahlstrom, Goldfield, Ford.
 46072....R. Alexander, Goldfield, Ford.
 46073....G. H. Cook, Goldfield, Ford.
 46074....Harry Ernest, Goldfield, Ford.
 46075....Jerry Berolo, Goldfield, Ford.
 46076....Union Land & C. Co., Deeth, Dodge.
 46077....Fru Wortham, Reno, Overland.
 46078....Arthur Shaw, Wonder, Overland.
 46079....T. F. Bressner, Elko, Ford.
 46080....Elko Town Government, Elko, Ford.
 46081....Elko Town Government, Elko, Mack.
 46082....S. B. Kaspar, Golconda, Ford.
 46083....Forrest Parry, Vya, Ford.
 46084....Lyle L. Perry, Vya, Ford.
 46085....Edward W. Ralph, Reno, Ford.
 46086....E. Rey, Reno, Overland.
 46087....John T. Popovich, Elko, Ford.
 46088....S. H. Rosenthal, Reno, Buick.
 46089....M. Sorensen, Gardnerville, Oldsmobile.
 46090....Foulston Bros., Wellington, Buick.
 46091....J. A. Lawson, Silver City, Maxwell.
 46092....G. E. Richards, Fallon, Overland.
 46093....E. H. Jones, Reno, Pope-Hartford.
 46094....B. F. Taber, Reno, Maxwell.
 46095....Bruce Saulter, Reno, Buick.
 46096....W. T. Golding, Nixon, Dodge.
 46097....Geo. J. Myers, Midas, Buick.
 46098....Dr. Harrison, Fallon, Studebaker.
 46099....R. C. Jones, Fallon, Chevrolet.
 46100....M. K. Toohey, Reno, Ford.
 46101....J. W. Black, Virginia, Maxwell.
 46102....Roe & Kaiser, Fallon, Meteor.
 46103....Louis Lind, Reno, Ford.
 46104....Ed. Powers, Tonopah, Ford.
 46105....Frank Cudney, Elko, Paige.
 46106....S. E. Parshall, McGill, Ford.
 46107....Bennett Bros., Sparks, Ford.
 46108....J. J. Leonasio, Reno, Buick.
 46109....W. T. Maestretti, Austin, Hupmobile.
 46110....W. T. Maestretti, Austin, Ford.
 46111....Chango & Aldax, Minden, Buick.
 46112....C. W. Brown, Dayton, Buick.
 46113....Ruel Depoali, Mason, Ford.
 46114....John H. Gordon, Las Vegas, Ford.
 46115....J. C. Corniff, Reno, Dodge.
 46116....C. F. Toland, Tonopah, Ford.
 46117....Ed. Ruschendorf, Tonopah, Buick.
 46118....Clay Coreney, Tonopah, Hupmobile.
 46119....Bardoli Bros., Sharp, Ford.
 46120....Geo. S. Smith, Tonopah, Ford.
 46121....Leadville Mines Co., Gerlach, Ford.
 46122....Leadville Mines Co., Gerlach, Dodge.
 46123....A. C. Lee, Battle Mountain, Ford.
 46124....L. L. Allen, Fallon, Oldsmobile.
 46125....F. P. Batchelder, Elko, Ford.
 46126....J. E. Snelson, Elko, Essex.
 46127....G. B. Williams, Fallon, Ford.
 46128....G. B. Williams, Fallon, Dodge.
 46129....G. B. Williams, Fallon, Hudson.
 46130....Arthur Gradi, Suto, Maxwell.
 46131....Sunset Grocery, Elko, Ford.
 46132....S. H. Williams, Midas, Ford.
 46133....Ben Rotholz, Reno, Hudson.
 46134....E. Mathorpe, Reno, Oldsmobile.
 46135....Foulstone Bros., Wellington, Buick.
 46136....Saroni & Fultstone, Wellington, Ford.
 46137....Fred Ohls, Washoe, Ford.
 46138....C. J. McEwen, Virginia, Chevrolet.
 46139....W. G. Kline, Reno, Buick.
 46140....Gold Wedge Div. M. Co., Tonopah, Fd.
 46141....Arthur Ruffles, Tonopah, Ford.
 46142....C. C. Chapman, Goldfield, Ford.
 46143....C. E. F. Gruber, Goldfield, Overland.
 46144....W. W. Philbrick, Silver Peak, Overland.
 46145....J. H. Glasier, Mina, Ford.
 46146....E. W. Kronquist, Schurz, Maxwell.
 46147....Earl Mayfield, Tonopah, Ford.
 46148....W. H. Wend, Reno, Chalmers.
 46149....Al Neal, Tonopah, Ford.
 46150....A. W. Sewell Co., Tuscarora, Reo.
 46151....Wilbur H. Smiley, Deeth, Dodge.
 46152....George A. Grock, Deeth, Overland.
 46153....Wilbur H. Smiley, Deeth, Ford.
 46154....Mrs. Geo. R. Vardy, Wells, Ford.
 46155....P. D. Hinckley, Rebel Creek, Ford.
 46156....J. A. Lynn, Currant, Ford.
 46157....A. B. Gardner, Sunnyside, Oldsmobile.
 46158....A. W. Sewell Co., Tuscarora, Dodge.
 46159....V. B. Gardner, Sunnyside, Ford.
 46160....S. E. Hagans, Cherry Creek, Ford.
 46161....Willis B. Parsons, Reno, Chevrolet.
 46162....Mrs. E. H. Sweetland, Carson, Ford.
 46163....C. R. Wedertz, Wellington, Ford.
 46164....G. Briggs, Carson, Maxwell.
 46165....Harold Berger, Carson, Dodge.
 46166....M. E. Menenta, Carson, Chevrolet.
 46167....F. G. Liston, Reno, Rambler.
 46168....A. Colburn, Ruth, Overland.
 46169....Wm. T. Knight, McGill, Ford.
 46170....Gus Rainier, Tonopah, Ford.
 46171....Harry F. Brush, Reno, Ford.
 46172....Mrs. R. C. Louck, Reno, Ford.
 46173....O. S. Hayes, Reno, Ford.
 46174....O. E. Martin, Reno, Ford.
 46175....E. O. Dunnigan, Goldfield, Ford.
 46176....Fred Walthers, Jiggs, Dodge.
 46177....Herman Sadler, Jiggs, Buick.
 46178....W. C. Ruddell, Jr., Lovelock, Ford.
 46179....Lewis Harriet, Elko, Studebaker.
 46180....Chas. Drown, Lee, Dodge.
 46181....Robert R. Craig, Tonopah, Ford.
 46182....Chas. F. Geyer, Tonopah, Chevrolet.
 46183....J. A. Sewell, Elko, Hudson.
 46184....Geo. Bradbury, Fallon, Ford.
 46185....Rosetta Divide M. Co., Tonopah, Chev.
 46186....J. M. Fenwick, Tonopah, Dorris.
 46187....John Schringohat, Minden, Buick.
 46188....Emma L. Oeder, Carson City, Oldsmo.
 46189....Owen M. Langan, Tonopah, Ford.
 46190....J. T. Darrough, Round Mtn., Oakland.
 46191....F. W. Gundelach, Kimberly, Ford.
 46192....O. J. Belville, Tonopah, Hudson.
 46193....O. J. Belville, Tonopah, GMC.
 46194....W. H. Wing, Tonopah, Ford.
 46195....Gus Raessler, Mina, Hupmobile.
 46196....J. A. Carlson, Cherry Creek, Dodge.
 46197....Comstock M. Co., Silver Peak, Speedw.
 46198....L. P. Durham, Reno, Dodge.
 46199....Wm. G. Peters, Reno, Ford.
 46200....Gilbert Ross, Carson City, Chandler.
 46201....Wm. Catton, Carson City, Reo.
 46202....T. O. Burrus, Joulon, Overland.
 46203....Wm. C. B. Bertrand, Reno, Oakland.
 46204....C. B. Clark, Reno, Case.
 46205....Pio Casci, Reno, Ford.
 46206....Fred Davis, Reno, Oakland.
 46207....Joe Frey, Stillwater, Oakland.
 46208....Palace Market, Sparks, Ford.
 46209....Fred W. Steiner, Sparks, Oakland.
 46210....W. S. Olinger, Vya, Ford.
 46211....Chas. Doherty, Carlin, Ford.
 46212....Nevada Stage Co., Goldfield, Packard.
 46213....J. H. Martin, Goldfield, Cadillac.
 46214....Eddie Johnson, Tonopah, Chevrolet.
 46215....O. P. Naylor, Las Vegas, Ford.
 46216....Mrs. V. L. Rose, Battle Mtn., Ford.
 46217....Albert H. Doherty, Carlin, Ford.
 46218....M. A. Howard, McGill, Oakland.
 46219....O. C. Troupe, Carlin, Buick.
 46220....J. W. Crane, Goldfield, Ford.
 46221....George H. Howard, Goldfield, Ford.
 46222....Ed. Thornton, Fallon, Ford.
 46223....D. M. King, Tonopah, Ford.
 46224....J. F. DeWitt, Reno, Hupmobile.
 46225....N. Ceccorelli, Sparks, Oakland.
 46226....E. S. Giles, Goldfield, Studebaker.
 46227....Ed. Yenter, Manhattan, Dodge.
 46228....G. A. Knox, Yerington, Overland.
 46229....Gregorio Urrutia, Geyer, Dodge.
 46230....F. Anderson, Reno, National.
 46231....Herman Davis, Reno, Cadillac.
 46232....Fred Hawkins, Fallon, Oakland.
 46233....W. G. Warren, Wabuska, Ford.
 46234....W. G. Warren, Wabuska, Buick.

- 46235...J. H. LeToe, Goldfield, Ford.
 46236...E. H. Beemer, Reno, Cadillac.
 46237...Spearhead M. Co., Goldfield, Ford.
 46238...Jesse Waite, Bunkerville, Ford.
 46239...Mrs. M. H. Fisher, Arden, Studebaker.
 46240...Raymond F. Robb, Tonopah, Chevrolet.
 46241...Emilie Dotta, Elko, Ford.
 46242...Carl Olsen, Contract, Dodge.
 46243...H. B. Kendall, Elko, Overland.
 46244...Frank Jeanney, Wells, Chevrolet.
 46245...L. E. Kendrick, Battle Mtn., Ford.
 46246...Angelo Balsi, Reno, Dodge.
 46247...L. L. Leonasio, Reno, Dodge.
 46248...Eureka Croesus M. Co., Eureka, Olds.
 46249...John Boitano, Eureka, Ford.
 46250...Hecla Divide M. Co., Tonopah, Buick.
 46251...Hecla Divide M. Co., Tonopah, GMC.
 46252...Russell Nash, Reno, Maxwell.
 46253...Simpson Ditch Co., Simpson, Ford.
 46254...J. W. Locklin, Virginia, Dort.
 46255...George Silvester, Hudson, Ford.
 46256...Alphon Glock, Minden, Ford.
 46257...Gansberg & Dreyer, Minden, Chandler.
 46258...A. O. Taylor, Gardnerville, Ford.
 46259...Julius Neubouse, Gardnerville, Buick.
 46260...E. A. Granquist, Winnemucca, Dort.
 46261...Theo. Weller, Paradise, Ford.
 46262...Mrs. Ida Workman, Winnemucca, Ford.
 46263...G. K. Woods, Winnemucca, Ford.
 46264...G. K. Woods, Winnemucca, Internatl.
 46265...P. A. Mink, Denio, Oreg., Ford.
 46266...Frank Sellers, Willow Point, Ford.
 46267...Otto Riel, Winnemucca, Ford.
 46268...W. W. Smith, Winnemucca, Ford.
 46269...Abel & Curtner, Willow Point, Ford.
 46270...Abel & Curtner, Willow Point, Ford.
 46271...Abel & Curtner, Willow Point, Allen.
 46272...J. F. Harvey, Paradise, Ford.
 46273...A. F. Jackson, Winnemucca, Ford.
 46274...J. C. Dillard, Carson City, Chevrolet.
 46275...Mrs. Fred J. Rulison, Reno, Dodge.
 46276...George L. Nicholas, Yerington, Ford.
 46277...C. E. Mills, Fallon, Buick.
 46278...Geo. S. Weston, Luning, Ford.
 46279...W. G. Warren, Wabaska, Ford.
 46280...W. G. Warren, Wabaska, Buick.
 46281...J. H. LeToe, Goldfield, Ford.
 46282...Joseph Sleeman, Ely, Buick.
 46283...R. Krumbein, Deeth, Buick.
 46284...William C. Mills, Deeth, Ford.
 46285...Emile Meitetal, Tuscarora, Ford.
 46286...N. E. Swalberg, Tuscarora, Ford.
 46287...Alfred Scambi, Tuscarora, Ford.
 46288...O. F. Freemonth, Fernley, Ford.
 46289...Homer Winters, Golconda, Hupmobile.
 46290...J. N. Gaillac, Goldfield, Thomas.
 46291...Al McCoy, Goldfield, Ford.
 46292...John Ward, Las Vegas, Ford.
 46293...Perry A. Young, Corn Creek, Ford.
 46294...B. F. Sing, Arden, Maxwell.
 46295...Martin Kofoed, Lovelock, Maxwell.
 46296...C. H. Meeker, Sparks, Buick.
 46297...A. J. Schell, Gerlach, Ford.
 46298...John H. Hammond, Ursine, Dodge.
 46299...J. W. Strand, Baker, Ford.
 46300...Grant Smith, Baker, Republic.
 46301...E. W. Meecham, Baker, Ford.
 46302...Veto La Conte, Kimberly, Ford.
 46303...Antolin Guerrica, Baker, Dodge.
 46304...R. H. Bassett, Baker, Ford.
 46305...Baker Livestock Co., Baker, Marmon.
 46306...A. Ferguson, Ely, Stewart.
 46307...H. Wilcox, Ely, Studebaker.
 46308...H. J. Marriott, Ocoola, Reo.
 46309...Steven Doutre, Aurum, Republic.
 46310...Herman Tietz, Jr., Ely, National.
 46311...Steven Doutre, Aurum, Dodge.
 46312...A. L. Parker, Ely, Ford.
 46313...W. W. Page, Ely, Ford.
 46314...P. Pastoroni, Preston, Ford.
 46315...A. G. Burton, Ely, Ford.
 46316...C. S. Miller, Ely, Ford.
 46317...G. P. Wings, McGill, Ford.
 46318...Simon Mina M. Co., Tonopah, Dodge.
 46319...Verdi Lumber Co., Elko, Ford.
 46320...Clinton W. Spark, Tonopah, Studebaker.
 46321...W. W. Wells, Junco, Ford.
 46322...R. M. Bell, Pahrump, Ford.
 46323...Milo C. McMillan, Reno, Buick.
 46324...Dr. E. Carver, Steamboat, Lexington.
 46325...W. E. Toney, Vya, Ford.
 46326...Bullion M. Co., Jean, Ford.
 46327...Irene E. Gray, Carson City, Chevrolet.
 46328...Ed. A. Ducker, Carson City, Mitchell.
 46329...Mrs. H. Riker, Reno, Overland.
 46330...J. W. Legate, Carson City, Ford.
 46331...Highway Dept., Carson City, Ford.
 46332...H. H. Trumbo, Mound House, Ford.
 46333...Wm. O. Young, McGill, Maxwell.
 46334...R. C. Ricker, Fallon, Overland.
 46335...James Compton, Sweetwater, Dodge.
 46336...Mike Robert, Reno, Ford.
 46337...M. H. Kuhn, Reno, Ford.
 46338...Mrs. W. E. Shirley, Reno, Chalmers.
 46339...S. L. Netherton, Wellington, Ford.
 46340...Mrs. Ralph J. Wiese, Reno, Chalmers.
 46341...L. Sing, Reno, Willys-Knight.
 46342...Burt Reddick, Virginia, Ford.
 46343...A. L. Dressler, Reno, Marmon.
 46344...John A. Dordano, Currie, Ford.
 46345...W. O. Smith, Washoe, Ford.
 46346...John Pengelly, Carlin, Dodge.
 46347...O. A. Pemcock, Elko, Dodge.
 46348...Tri-O-Lite Products Co., Carlin, Dodge.
 46349...S. M. Davis, Deeth, Ford.
 46350...J. B. Kleckner, Elko, Grant.
 46351...C. J. Jeanney, Deeth, Dodge.
 46352...H. M. Lane, Deeth, Overland.
 46353...D. W. Hyde, Metropolis, Ford.
 46354...Harry A. Day, Wells, Chevrolet.
 46355...R. H. Pomeroy, McGill, Chandler.
 46356...S. A. Merkley, Elko, Oldsmobile.
 46357...Harry Lee McFall, Elko, Dodge.
 46358...Bert Reed, Reno, Ford.
 46359...Frank N. Davis, Reno, Ford.
 46360...W. H. Elwell, Las Vegas, Ford.
 46361...W. H. Elwell, Las Vegas, Ford.
 46362...E. E. McCoy, Elko, Ford.
 46363...C. E. Secor, Elko, Dodge.
 46364...W. H. Reinken, Elko, Dodge.
 46365...C. E. Farve, Elko, Dodge.
 46366...Frank W. Hoyt, Fallon, Ford.
 46367...A. Johnson, Verdi, Ford.
 46368...D. C. Ward, Tonopah, Ford.
 46369...E. W. Jones, Sparks, Overland.
 46370...Herbert C. Hoover, Fallon, Dodge.
 46371...W. E. Stalny, Sparks, Dodge.
 46372...Geo. W. Lathrop, Reno, Buick.
 46373...C. Gallo, Elko, Overland.
 46374...H. H. Coryell, Wells, Dodge.
 46375...S. R. Whitehead, Overton, Ford.
 46376...A. C. Tidwell, Reno, Reo.
 46377...D. H. Butler, Tonopah, Reo.
 46378...Thomas Pearce, Tonopah, Hupmobile.
 46379...C. A. Liddell, Tonopah, Ford.
 46380...F. A. Arnold, Divide City, Ford.
 46381...W. A. Hess, Manhattan, Ford.
 46382...Lawrence Christensen, Tonopah, Ford.
 46383...T. H. Smith, Beatty, Ford.
 46384...C. M. Compton, Luning, Reo.
 46385...John Buser, Dyer, Ford.
 46386...J. D. Hilton, Pioneer, Ford.
 46387...Harry DeVotie, Goldfield, Ford.
 46388...United C. & P. Co., Goldfield, Ford.
 46389...Edward M. Hall, Reno, Dodge.
 46390...Clarence Nelson, Yerington, Ford.
 46391...A. Frandsen, Reno, Pilot.
 46392...Andrew Frandsen, Reno, Hudson.
 46393...Albert Pearl, Virginia, Federal.
 46394...Berry Laudis, Reno, Ford.
 46395...G. P. Lizer, Reno, Ford.
 46396...Martin Echania, McDermitt, Ford.
 46397...G. Gordon, Reno, Ford.
 46398...A. McElhaney, Yerington, Ford.
 46399...C. F. Duval, Virginia, Winton.
 46400...A. L. Dressler, Reno, Ford.
 46401...B. H. Shartle, Ruth, Ford.
 46402...J. T. Deacy, Sharp, Ford.
 46403...C. E. Stephens, Sharp, Hupmobile.
 46404...R. I. Johnson, Sharp, Ford.
 46405...Frank E. McCarty, Ruth, Saxon.
 46406...Mrs. Stella Warfield, Reno, Saxon.
 46407...Wm. A. Bradley, Silver Peak, Vulcan.
 46408...Wm. A. Bradley, Silver Peak, Packard.

- 46409...Union Land & Cattle Co., Reno, Ford.
 46410...Union Land & Cattle Co., Reno, Ford.
 46411...E. Whetstone, East Ely, Saxon.
 46412...Eph Oxborrow, Lund, Ford.
 46413...J. B. Oxborrow, Round Mtn., Ford.
 46414...Dan Johnson, Ruth, Overland.
 46415...C. W. Hicks, Reno, Stutz.
 46416...Joseph Bargiel, McGill, Maxwell.
 46417...Katherine M. Moran, Tonopah, Ford.
 46418...Wonecott & Cavanaugh, Tonopah, Mich.
 46419...George Foley, Round Mountain, Ford.
 46420...H. C. Stimler, Tonopah, Ford.
 46421...Frank Gendron, Round Mountain, Ford.
 46422...F. M. Foster, Tonopah, Ford.
 46423...R. C. Donovan, Tonopah, Essex.
 46424...Arrowhead M. Co., Arrowhead, Ford.
 46425...Frank Cook, Tonopah, Ford.
 46426...T. G. Nichol, Wabuska, Chevrolet.
 46427...Earl T. Godbe, Pioche, Ford.
 46428...F. Altenburg, Battle Mountain, Ford.
 46429...A. Altenburg, Battle Mountain, Ford.
 46430...W. Altenburg, Battle Mountain, Ford.
 46431...F. Altenburg, Battle Mountain, Dodge.
 46432...Lee Lakin, Beowawe, Ford.
 46433...Utah Constr. Co., Montello, Dodge.
 46434...Cactus Nevada M. Co., Goldfield, Ford.
 46435...J. G. Van Ethen, Candelaria, Ford.
 46436...Cora Ferguson, Fallon, Buick.
 46437...Henry F. Close, Jr., Sparks, Studebkr.
 46438...Fred Calton, Metropolis, Ford.
 46439...J. L. Vandiver, Wells, Dodge.
 46440...Orin S. Mead, Wells, Ford.
 46441...George Ralph, Wells, Oakland.
 46442...H. W. Glenn, Arthur, Ford.
 46443...Stanley L. Wines, Ruby Valley, Intl.
 46444...S. V. Smiley, Deeth, Buick.
 46445...Martin Arnestoy, Elko, Hudson.
 46446...Charles P. McNew, Lamoille, Chevrolet.
 46447...Tom Clifford, Eureka, Dodge.
 46448...John Clifford, Eureka, Dodge.
 46449...Eureka Gar. & Sup. Co., Eureka, Olds.
 46450...Ruby Hill Dev. Co., Eureka, Dodge.
 46451...Eureka Land & S. Co., Eureka, Ford.
 46452...H. E. Saviers, Reno, Chandler.
 46453...Mrs. Betty M. Baur, Reno, Buick.
 46454...Mrs. O. B. Douglas, Reno, Studebaker.
 46455...Jas. Block, Reno, Studebaker.
 46456...T. B. Bennett, Reno, Chevrolet.
 46457...R. W. Halsell, Midas, Overland.
 46458...R. L. Norris, Lovelock, Ford.
 46459...Chas. H. Vaoney, Reno, Oakland.
 46460...Frank Fuss, Lovelock, Ford.
 46461...Hanson Bros., Lovelock, Scripps-Booth.
 46462...Miss Iva Johnson, Lovelock, Overland.
 46463...W. J. May, Sparks, Maxwell.
 46464...H. N. Tayne, Sparks, Overland.
 46465...D. Kimmell, Sparks, Studebaker.
 46466...Ernest J. McHan, Elko, Ford.
 46467...A. L. Podgett, Dyer, Peerless.
 46468...W. W. Caffrey, Reno, Studebaker.
 46469...B. S. Long, Battle Mountain, Ford.
 46470...F. H. Pratt, Reno, Liberty.
 46471...Christine Kearsley, St. Thomas, Ford.
 46472...Wilton Davis, Reno, Hudson.
 46473...Ben Garrett, Pioche, EMF.
 46474...U. S. Dept. Agriculture, Fallon, Ford.
 46475...Desert Forwarding Co., Tonopah, Nash.
 46476...Roy L. Primeaux, Tuscarora, Ford.
 46477...James Daniel, Reno, Ford.
 46478...V. F. Christenson, Reno, Ford.
 46479...Walter D. Armstrong, Elko, Buick.
 46480...D. B. Williams, Tuscarora, Ford.
 46481...Mrs. Margaret Ryan, Imlay, Dort.
 46482...W. C. Morey, McGill, Ford.
 46483...E. D. Loveridge, McGill, Ford.
 46484...James E. Lowe, Las Vegas, Studebkr.
 46485...Nick Rogers, Manhattan, Ford.
 46486...Rees Jenkins, Reno, Fageol.
 46487...E. J. Van Kirk, Reno, Ford.
 46488...F. Magol, Reno, Buick.
 46489...W. H. Davis, Sparks, Ford.
 46490...Frank Cliff, Carson City, Chevrolet.
 46491...G. Colozo, Virginia, Studebaker.
 46492...Andy Rabbit, Minden, Ford.
 46493...L. J. Hahn, Reno, Ford.
 46494...E. R. Dodge, Reno, Ford.
 46495...Rex C. Ewing, Goodeprings, Ford.
 46496...J. C. Byers, Reno, Oakland.
 46497...Highway Dept., Carson City, Nash.
 46498...C. A. Jones, Carson City, Oakland.
 46499...Highway Dept., Carson City, Ford.
 46500...Mrs. Mary E. Dickey, Reno, Overland.
 46501...F. A. Murphy, Eagleville, Oldsmobile.
 46502...George Coppersmith, McDermitt, Ford.
 46503...Robt. Anderson, McDermitt, Ford.
 46504...Baptist Loda, McDermitt, Oakland.
 46505...Tom West, Las Vegas, Paige.
 46506...Thos. Griffin, Carlin, Chandler.
 46507...S. P. McMullen, Deeth, Ford.
 46508...S. P. McMullen, Deeth, Haynes.
 46509...J. Nalaskoski, Goldfield, Ford.
 46510...Joe Elcano, Reno, Buick.
 46511...Flaminio Tabarali, Tonopah, Ford.
 46512...L. K. Gebhardt, Tonopah, Ford.
 46513...Mrs. E. Branton, Reno, Ford.
 46514...Bessie Etnior, Reno, Buick.
 46515...Nevada Products Co., Reno, Dorris.
 46516...Albert W. Goble, Jr., Wells, Ford.
 46517...W. A. Toombs, Wells, Ford.
 46518...Gerhart Schoer, Wells, Ford.
 46519...R. J. Gray, Wells, Ford.
 46520...Chas. Holm, Wells, Ford.
 46521...Herbert Badt, Wells, Buick.
 46522...Phil Harney, Wells, Ford.
 46523...H. F. Hines, Fallon, Ford.
 46524...G. L. Ware, Montello, Ford.
 46525...E. J. White, Fallon, Ford.
 46526...Minnie Carter, Fallon, Ford.
 46527...H. C. Gerdemann, Fallon, Ford.
 46528...Geo. A. Simms, McDermitt, Maxwell.
 46529...Harry Dunseath, Tonopah, Oldsmobile.
 46530...P. J. Conway, Reno, Dodge.
 46531...W. B. Davey, Tonopah, Ford.
 46532...Bobby Patterson, Tonopah, Essex.
 46533...Daisy B. Mulvaney, Fallon, Ford.
 46534...Lee Pitt, Lovelock, Ford.
 46535...Elma Castle, Packard, Ford.
 46536...Pacific M. & F. Co., Lovelock, Ford.
 46537...F. E. Wadsworth, Panaca, Chevrolet.
 46538...J. L. Wadsworth, Panaca, Chevrolet.
 46539...J. J. Thurston, Montello, Buick.
 46540...A. P. Ten Voord, Eureka, Ford.
 46541...Chas. E. Johnston, Yerington, Buick.
 46542...Jos. T. Barton, Deeth, Ford.
 46543...Dewey L. Barton, Deeth, Ford.
 46544...Jos. T. Barton, Deeth, Ford.
 46545...Harry Curran, Reno, Chevrolet.
 46546...John J. Weiser, Las Vegas, Ford.
 46547...Chris. Helwinkel, Gardnerville, Ovrind.
 46548...H. E. Snare, Reno, Studebaker.
 46549...Joe Roberti, Gerlach, Ford.
 46550...Scott Izzer, Wellington, Reo.
 46551...W. L. Taylor, Manhattan, Dodge.
 46552...John M. Carter, Goodeprings, Ford.
 46553...B. M. Kennedy, Tonopah, Marion.
 46554...Ogle Swingle, Gerlach, Ford.
 46555...F. W. Lockman, Unionville, Buick.
 46556...A. P. Ceander, Reno, Oakland.
 46557...Miss Evelyn Swan, Reno, Baby Saxon.
 46558...Edu. District No. 1, Overton, Oldsmo.
 46559...Edu. Dist. No. 1, Overton, Ford.
 46560...Edu. Dist. No. 1, Overton, Ford.
 46561...Edu. Dist. No. 1, Overton, Dodge.
 46562...C. W. Clubine, Lamoille, Studebaker.
 46563...George Hennen, Elko, Studebaker.
 46564...R. H. Woolverton, Elko, Ford.
 46565...O. P. Ankeny, Elko, Essex.
 46566...Parley Reed, Elko, Ford.
 46567...B. W. Sawyer, Hilltop, Ford.
 46568...A. J. Romano, Romano, Ford.
 46569...Ida May McGee, Yerington, Ford.
 46570...Fay L. Baker, Mina, Hudson.
 46571...United Lodi M. Co., Luning, Buick.
 46572...Peter Organ, Mill City, Ford.
 46573...Peter Organ, Mill City, Dodge.
 46574...Mrs. K. F. Davidson, Mill City, Ford.
 46575...Mrs. John N. Cobb, Currant, Ford.
 46576...J. M. Houlihan, Goldfield, Ford.
 46577...P. A. Burke, Hornsilver, Ford.
 46578...G. M. Bettles, Goldfield, Dodge.
 46579...Mrs. F. Petersen, Goldfield, Overland.
 46580...Paul Pieretti, Dayton, Ford.
 46581...H. W. Harrington, Reno, Buick.
 46582...Roy Chichester, Smith, Buick.

- 46583...C. A. Yordin, Reno, Oldsmobile.
 46584...R. Kirman, Reno, Hudson.
 46585...Mrs. Carrie C. Schweis, Reno, Chevrolet.
 46586...Goodsprings M. Co., Goodsprings, Ford.
 46587...Jack Lacy, Goodsprings, Ford.
 46588...W. T. Jenkins Co., Battle Mtn., Ford.
 46589...W. T. Jenkins Co., Battle Mtn., Ford.
 46590...Oscar Eckman, Jr., Battle Mtn., Stude.
 46591...W. T. Jenkins Co., Battle Mtn., Buick.
 46592...Dodge Bros., Fallon, Ford.
 46593...John C. Mail, Hazen, Overland.
 46594...Linford D. Riley, Yerington, Ford.
 46595...Chiatovich & Beko, Tonopah, Chevrolet.
 46596...E. J. Questa, Reno, Oakland.
 46597...Wheeler Livestock Co., Reno, Ford.
 46598...Eric Carlson, Midas, Overland.
 46599...H. H. Wells, Goldfield, Ford.
 46600...Andrew Young, Reno, Ford.
 46601...A. B. Hoaglin, Clover City, Dodge.
 46602...Francis Byrne, Elko, Chevrolet.
 46603...G. E. Murray, Battle Mountain, Reo.
 46604...Joe Murray, Carlin, Dodge.
 46605...J. S. Wiggins, Reno, Chevrolet.
 46606...Nick Curnow, Reno, Chevrolet.
 46607...H. D. Sanborn, Reno, Chevrolet.
 46608...G. Crawford, Tonopah, Hupmobile.
 46609...C. Kanrohat, Round Mountain, Dodge.
 46610...M. J. Downey, Tonopah, Ford.
 46611...Yeiser & Harney, Goldfield, Ford.
 46612...A. J. Gilbert, Tonopah, Ford.
 46613...George Dersehug, Tonopah, Ford.
 46614...Dan Mathews, Panaca, Chevrolet.
 46615...R. E. Middagh, McGill, Premier.
 46616...John Hogan, Fallon, Ford.
 46617...T. E. Freeman, Fallon, Ford.
 46618...A. M. Dikline, Fallon, Ford.
 46619...G. R. Catterson, Yerington, Ford.
 46620...Arne Cas, Ely, Buick.
 46621...Frank J. Mark, Hamilton, Ford.
 46622...Robert Kershaw, Ely, Essex.
 46623...J. Rodrigues, Ely, Cadillac.
 46624...J. R. Puryear, Ruth, Studebaker.
 46625...R. Parker, Ely, Oldsmobile.
 46626...W. H. Lambert, Ely, Chalmers.
 46627...J. H. Harrington, Ely, Ford.
 46628...P. P. Bennett, Ely, Ford.
 46629...J. W. Johnston, Deeth, Overland.
 46630...J. E. Bevis, Tonopah, Buick.
 46631...C. W. Bafford, Rand, Ford.
 46632...G. H. Gilmore, Tuscarora, Overland.
 46633...Joe Martini, Dayton, Ford.
 46634...Carlo Digino, Dayton, Haynes.
 46635...Geo. D. Smith, Carson City, Haynes.
 46636...R. J. Smith, Carson City, Ford.
 46637...F. F. Franke, Fallon, Ford.
 46638...Sam Bigelow, Carson City, Oldsmobile.
 46639...Luning Idaho M. Co., Luning, Ford.
 46640...Robt. B. Todd, Reno, Ford.
 46641...Fred M. Johnson, Dayton, Overland.
 46642...P. Montecilli, Dayton, Hudson.
 46643...H. G. Brace & Co., Reno, Ford.
 46644...J. A. Curran, Reno, Ford.
 46645...C. R. Moorman, Kimberly, Ford.
 46646...S. J. Draper, McGill, Dodge.
 46647...Union L. & C. Co., Willow Point, Ford.
 46648...Union L. & C. Co., Willow Point, Ford.
 46649...Ellison Ranch Co., Rebel Creek, Ford.
 46650...J. P. Ellison, Rebel Creek, Buick.
 46651...J. H. Hastings, Pioche, Ford.
 46652...W. S. Rhoads, Las Vegas, Dodge.
 46653...Wm. McFarland, Eureka, Ford.
 46654...C. F. Gibson, Eureka, Ford.
 46655...V. Fulkerson, Fallon, Willys-Knight.
 46656...Mrs. H. O. Abbot, Lovelock, Ford.
 46657...P. R. Downs, Fallon, Chevrolet.
 46658...John H. Spencer, Austin, Overland.
 46659...H. W. McNeil, Yerington, Cole.
 46660...Jens Jensen, Verdi, Lexington.
 46661...Oreste Monasgratti, Verdi, Buick.
 46662...Ed. Merry, Fallon, Ford.
 46663...Owen T. Bosquit, Fallon, Studebaker.
 46664...Bert Guinnell, Fallon, Dodge.
 46665...G. M. Lofthouse, Fallon, Hupmobile.
 46666...Simmons Hdw. Co., Las Vegas, Ford.
 46667...E. A. Blier, McGill, Pullman.
 46668...Oro H. Smith, Fallon, Ford.
 46669...Eibert Howard, Las Vegas, Ford.
 46670...W. McDaniel, Las Vegas, Buick.
 46671...Marcus Errecalde, Battle Mtn., Ford.
 46672...Francis Bernard, Goldfield, Ford.
 46673...Ernesto Zuech, Goldfield, Ford.
 46674...Joan Etchepare, Hawthorne, Buick.
 46675...Percy Gobin, Austin, Ford.
 46676...P. Peterson, Bruner, Dodge.
 46677...Ed. Helth, Lamolle, Dodge.
 46678...James Martin, North Fork, Dodge.
 46679...Anna E. Dunn, Reno, Franklin.
 46680...C. H. Burner, Elko, Ford.
 46681...C. L. Tobin, Winnemucca, Buick.
 46682...Jose Gastanaga, Paradise, Dodge.
 46683...Nevada Con. Copper Co., McGill, Ford.
 46684...Nevada Con. Copper Co., McGill, Vim.
 46685...Nevada Con. Copper Co., Ruth, Hudson.
 46686...Nevada Con. Copper Co., McGill, Pack.
 46687...Nevada Con. Copper Co., Ruth, Pack.
 46688...Nevada Con. Copper Co., McGill, Pack.
 46689...Nevada Con. Copper Co., Ruth, Pack.
 46690...Nevada Con. Copper Co., McGill, Pack.
 46691...Nevada Con. Copper Co., Ruth, Pack.
 46692...Mr. McCarthy, Reno, Buick.
 46693...D. T. Wise, Yerington, Ford.
 46694...J. P. Phillips, Tuscarora, Essex.
 46695...R. T. Evans, Elko, Reo.
 46696...J. S. Younes, Elko, Ford.
 46697...Ernest Shirley, Silver Peak, Overland.
 46698...W. Cain, Reno, Ford.
 46699...Clay Spring C. Co., Las Vegas, Autocar.
 46700...Clay Spring C. Co., Las Vegas, Ford.
 46701...G. W. Hall, Las Vegas, Dodge.
 46702...Geo. Mitchell, Jiggs, Buick.
 46703...F. A. Fulkerson, Beowawe, Ford.
 46704...C. F. Buffington, Moapa, Ford.
 46705...Carl Huttman, Fallon, Ford.
 46706...J. B. Davis, Fallon, Chevrolet.
 46707...Oscar L. Peiffer, Las Vegas, Ford.
 46708...Ray W. Harris, Tonopah, Ford.
 46709...Joseph P. Giroux, Marietta, Packard.
 46710...Chas. W. Brandon, Goldfield, Buick.
 46711...T. S. Delano, Sparks, Hupmobile.
 46712...P. H. Gallagher, Carrara, Apperson.
 46713...Peter G. Contros, Flanigan, Ford.
 46714...H. D. Goldbach, Belmont, Chevrolet.
 46715...Charles Miller, Battle Mountain, Ford.
 46716...Fred H. Jackson, Tonopah, Ford.
 46717...Walter J. Foley, Reno, Buick.
 46718...Union Land & Cattle Co., Reno, Dodge.
 46719...Joseph McDermott, Mina, Federal.
 46720...Mebius Drescher Co., Reno, Marmon.
 46721...K. R. McKenzie, Denio, Ford.
 46722...Eli Cann, Fallon, Ford.
 46723...General Metals Co., Lovelock, Reo.
 46724...Chas. Demarchi, Tonopah, Ford.
 46725...L. M. Cline, Smith, Reo.
 46726...Pete Cassinelli, Sparks, Chandler.
 46727...H. C. Korn, Fallon, Ford.
 46728...A. C. Grindling, Tonopah, Ford.
 46729...Sunbeam Divide Co., Tonopah, Dodge.
 46730...George Anderson, Belmont, Ford.
 46731...Otto Ferdw, Tonopah, Ford.
 46732...W. G. Gregory, Tonopah, Ford.
 46733...Ross Peterson, Reno, Chandler.
 46734...T. A. Sykes, Tonopah, Ford.
 46735...Walter Dressler, Fallon, Overland.
 46736...J. J. Pierce, Wellington, Ford.
 46737...Walter E. Lyons, Reno, Buick.
 46738...J. B. Scott, Omeo, Buick.
 46739...Matthew Halliahn, Reno, Ford.
 46740...R. A. Rickard, Reno, Empire.
 46741...J. H. Welch, Reno, Metz.
 46742...Gaston Uhalde, Eureka, Studebaker.
 46743...Henry Parmigeau, Eureka, Ford.
 46744...J. Carlos Lambert, Metropolis, Ford.
 46745...William Lee, Montello, Ford.
 46746...Vernon Metcalf, Reno, Dodge.
 46747...F. R. Sprague, McDermitt, Grant.
 46748...A. D. Casey, Wabauka, Ford.
 46749...J. E. Hicks, Fallon, Chevrolet.
 46750...W. Waterman, Jr., Reno, Ford.
 46751...Sam King, Gerlach, Ford.
 46752...Sam King, Gerlach, Kleiber.
 46753...W. H. Settlemeyer, Elko, Dodge.
 46754...E. J. Lupien, Winnemucca, Ford.
 46755...Steve Ferraro, Paradise, Ford.
 46756...Ellison Ranch Co., Red House, Ford.

- 46757....Chas. A. Wann, Paradise, Ford.
 46758....Otto Dangelmaier, Amos, Ford.
 46759....I. B. English, Amos, Ford.
 46760....Elmer Cathcart, Paradise, Ford.
 46761....Joseph Planck, Vahny, Ford.
 46762....Mrs. Alma Boyd, Winnemucca, Ford.
 46763....Joe Yragui, Stockton, Cal., Dodge.
 46764....Thos. E. Powell, Winnemucca, Overland.
 46765....Dr. Thompson, Winnemucca, Chevrolet.
 46766....T. J. Shannon, Winnemucca, Intl.
 46767....Frank Bengoa, Winnemucca, Cadillac.
 46768....Martin Legarza, Amos, Ford.
 46769....Joaquin Elizondo, Winnemucca, Dodge.
 46770....W. J. Spear, Reno, Ford.
 46771....F. E. Valencia, Reno, Ford.
 46772....Samuel S. Arentz, Simpson, Buick.
 46773....Harvey Eggleston, Halleck, Ford.
 46774....Ed. Halstead, Currant, Chevrolet.
 46775....J. P. Sweeney, Goldfield, Dodge.
 46776....John H. Goodale, Deeth, Ford.
 46777....J. E. Smith, Reno, Dodge.
 46778....Louis V. Pflum, Imlay, Pope-Hartford.
 46779....Wm. Blundon, Nelson, Ford.
 46780....Edith E. Mason, Reno, Marmon.
 46781....R. C. Bass, Fallon, Ford.
 46782....John A. Sharp, Arthur, Oldsmobile.
 46783....R. A. Hardy, Fallon, Ford.
 46784....Chas. Akin, Tonopah, Ford.
 46785....V. R. Hughes, Tonopah, Hudson.
 46786....Frank O. Arthur, Tonopah, Ford.
 46787....Walter Dobbs, Battle Mtn., Overland.
 46788....Manuel Urrutia, Elko, Dodge.
 46789....J. W. Henriod, Parker, Ford.
 46790....Eugene A. Henriod, Parker, Dodge.
 46791....Wilson Bros., Arden, Dodge.
 46792....Jos. L. Moore, Currie, Ford.
 46793....Fred Martin, Currie, Ford.
 46794....Pedro Ordoquin, Currie, Ford.
 46795....Raahe Reynolds Co., Currie, Dodge.
 46796....Owen Coughlin, Reno, Chalmers.
 46797....Al. Newman, Reno, Reo.
 46798....Merrill Marker, Lovelock, Ford.
 46799....Addie Stoker, Lovelock, Chevrolet.
 46800....C. F. Campbell, Lovelock, Reo.
 46801....Garcia Saddlery Co., Elko, Ford.
 46802....C. F. Hayman, Elko, Ford.
 46803....J. E. Williams, Lee, Buick.
 46804....John Yowell, Lee, Ford.
 46805....W. W. Cogswell, Fernley, Buick.
 46806....John B. Matley, Reno, Mitchell.
 46807....Egon G. Anderson, Reno, Dodge.
 46808....John Beel, Reno, Ford.
 46809....Cecil Creel, Reno, Ford.
 46810....W. P. Barrett, Reno, Ford.
 46811....Mrs. George Fay, Minden, Ford.
 46812....B. L. Smith, Elko, Ford.
 46813....Russel Trathen, Reno, Ford.
 46814....Joe Johnson, Tonopah, Overland.
 46815....Joe Brunn, Tonopah, Hewitt-Ludlow.
 46816....Geo. Peterson, McGill, Dort.
 46817....R. J. Kolstrup, Fallon, Maxwell.
 46818....Jim Low & Co., McDermitt, Ford.
 46819....O. M. Norris, Caliente, Grant.
 46820....Mrs. Geo. W. Abel, Beowawe, Overland.
 46821....Darrell Wynn Lear, Lamolle, Oakland.
 46822....Stanley Johnson, Panaca, Chevrolet.
 46823....J. B. Beale, Eureka, Oldsmobile.
 46824....O. J. Fener, Nelson, Ford.
 46825....Charles E. Cady, Montello, Ford.
 46826....A. B. Anderson, Winnemucca, Ford.
 46827....S. E. Whitney, Las Vegas, Ford.
 46828....Clark Bowman Co., Las Vegas, Ford.
 46829....James German, Las Vegas, Oakland.
 46830....A. C. Tidwell, Reno, Reo.
 46831....J. C. Conway, Reno, Ford.
 46832....John Harris, Reno, Dodge.
 46833....Wm. Pentecost, Elko, Ford.
 46834....C. E. Matthews, Reno, Ford.
 46835....H. S. Pohe, Yerington, Overland.
 46836....L. R. Hafen, Bunkerville, Ford.
 46837....Heber H. Hanby, Bunkerville, Ford.
 46838....G. Wilkerson, Reno, Chandler.
 46839....Geo. Watson, Wadsworth, Haynes.
 46840....Central A. & M. Works, Reno, Buick.
 46841....Mrs. W. H. Corbett, Reno, Reo.
 46842....R. H. Summers, Tonopah, Ford.
 46843....Prent Leverich, Artesia, Ford.
 46844....Manuel Bastida, Charleston, Chevrolet.
 46845....Manuel Bastida, Charleston, Studebkr.
 46846....Parley E. Hatch, Deeth, Ford.
 46847....Bruneau Sheep Co., Idaho, GMC.
 46848....A. J. Byrd, Fallon, Knox.
 46849....Morris P. Kirk, Goodsprings, Cadillac.
 46850....Yellow Pine M. Co., Goodsprings, Cad.
 46851....J. A. Gilbert, Tonopah, Cadillac.
 46852....C. C. Hilton, Reno, Buick.
 46853....H. A. Taylor, Mill City, Ford.
 46854....F. L. Whipple, Sunnyside, Chevrolet.
 46855....F. H. Givens, McGill, Ford.
 46856....Horton Hammond, Metropolis, Ford.
 46857....C. A. Ambrose, Carson City, Ford.
 46858....Walter Poirer, Genoa, Studebaker.
 46859....Ira Winters, Carson City, Scripps-B.
 46860....Ralph C. Olsen, Sulphur, Ford.
 46861....H. O. Russell, Searchlight, Ford.
 46862....Mrs. Burd Lindsay, Carson, Maxwell.
 46863....T. E. Jones, Jr., Reno, Buick.
 46864....Edgar R. Young, Tuscarora, Ford.
 46865....Elbert Anderson, Deeth, Dodge.
 46866....R. T. Anderson, Deeth, Dodge.
 46867....J. M. Vance, Elko, Maxwell.
 46868....Balbino Achabal, Tuscarora, Hudson.
 46869....E. P. Walters, Arrowhead, Chevrolet.
 46870....W. W. Cooke, M.D., Ely, Dodge.
 46871....James F. Holland, Lamolle, Ford.
 46872....James J. Buckskin, Tonkin, Ford.
 46873....Lucky Boy Divide, Tonopah, Maxwell.
 46874....E. E. Seyler, Manhattan, Ford.
 46875....V. C. Updike, Reno, Apperson.
 46876....W. W. Davis, Yerington, Ford.
 46877....E. E. Glaser, Tobar, Dodge.
 46878....E. A. Dyer, Wabuska, Overland.
 46879....F. H. Scheele, Gardnerville, Overland.
 46880....Tonopah Belmont Co., Tonopah, Cad.
 46881....Metropolis Land Co., Metropolis, Ford.
 46882....Metropolis Land Co., Metropolis, Ford.
 46883....F. L. Littell, Yerington, Reo.
 46884....Martin J. Burke, Reno, Chandler.
 46885....Chris. Jacobsen, Reno, Reo.
 46886....J. A. Gilman, Reno, Scripps-Booth.
 46887....John S. Short, Reno, Hupmobile.
 46888....Blair Mines Co., Silver Peak, Hudson.
 46889....Kenneth C. Tate, Reno, Dodge.
 46890....Reno P. L. & W. Co., Reno, Ford.
 46891....Mrs. Eva Jakowatz, Goldfield, Ford.
 46892....Mrs. Eva Jakowatz, Goldfield, Dorris.
 46893....Mrs. Eva Jakowatz, Goldfield, Dodge.
 46894....Mrs. Eva Jakowatz, Goldfield, Federal.
 46895....E. Leusenkaamp, Fallon, Ford.
 46896....Elmer Hylton, Jiggs, Oakland.
 46897....Grover Russell, Carson City, Ford.
 46898....G. R. Leidy, Fallon, King.
 46899....G. R. Leidy, Fallon, Ford.
 46900....H. J. Ellert, Virginia, Overland.
 46901....Douglass Renfro L. Co., Fallon, Ford.
 46902....Robert Donnelly, Goldfield, Maxwell.
 46903....Goldfield Tule M. Co., Goldfield, Ford.
 46904....Harry Moon, Goldfield, Ford.
 46905....August Pasquale, Paradise, Ford.
 46906....A. P. Kanter, Tonopah, Buick.
 46907....R. C. Lockridge, Goodsprings, Ford.
 46908....G. C. Richardson, Las Vegas, Ford.
 46909....E. L. Stiff, Lovelock, Chevrolet.
 46910....Jas. F. Boggs, McGill, Ford.
 46911....Wm. F. Huren, McGill, Paige.
 46912....Virginia Dolmne, Pioche, Dodge.
 46913....A. T. Dakell, Twin Springs, Ford.
 46914....Wm. Young, Goldfield, Ford.
 46915....G. M. Bettles, Goldfield, Hupmobile.
 46916....R. A. Rickard, Reno, Metz.
 46917....B. Hesgney, Reno, Maxwell.
 46918....Jack Shepard, Elko, Buick.
 46919....Norman M. Kelley, Las Vegas, Ford.
 46920....E. T. McClure, Las Vegas, Maxwell.
 46921....Livingston Ranch Co., Moapa, Chevro.
 46922....Antonio Yzaguirre, Tiptect, Ford.
 46923....Mrs. G. Millett, Round Mtn., Maxwell.
 46924....Thornton Read, Reno, Ford.
 46925....John Rusteen, Verdi, Ford.
 46926....A. E. Hammond, Reno, Ford.
 46927....Al. Towne, Reno, Ford.
 46928....C. W. Goodrich, Millers, Ford.
 46929....W. T. Parker, Sheephead, Ford.
 46930....W. C. Forsythe, Fallon, Ford.

- 46931...L. Radcliffe, Reno, Overland.
 46932...Mrs. Barbara Ruf, Goldfield, Ford.
 46933...Frank M. Bullock, Lovelock, Ford.
 46934...J. C. Cowden, Tonopah, Maxwell.
 46935...Andy Bulsieh, Tonopah, Ford.
 46936...H. R. Hartley, Tonopah, Ford.
 46937...Carlo Johnson, Reno, Overland.
 46938...C. R. Archer, Yerington, Dodge.
 46939...Percy C. Wright, Yerington, Oakland.
 46940...C. E. Roberts, Reno, Ford.
 46941...Edwin E. Matthew, Hudson, Buick.
 46942...C. M. Smith, Reno, Essex.
 46943...R. W. Taylor, Reno, Reo.
 46944...W. H. Currie, East Ely, Ford.
 46945...S. H. Williams, Ely, Paige.
 46946...Pete Garias, Ely, Studebaker.
 46947...Athena Mercantile Co., Ely, Ford.
 46948...Gus Jeffers, Kimberly, Chandler.
 46949...Dr. John H. Bailey, East Ely, Buick.
 46950...George Gianopulos, McGill, Hupmobile.
 46951...L. A. Williams, Currant, Ford.
 46952...Roy Musgrave, Ely, Ford.
 46953...A. C. Kirby, Osceola, Ford.
 46954...Ed W. Clark, Las Vegas, Republic.
 46955...Clark & Ronnow, Las Vegas, Hupmo.
 46956...Ed Schreck, Elko, Ford.
 46957...Walter Hansen, Reno, Studebaker.
 46958...M. B. Salisbury, Tybo, Oldsmobile.
 46959...H. Maytell, Minden, Velie.
 46960...E. A. Danielson, Pioneer, Overland.
 46961...R. L. Douglass, Fallon, Stutz.
 46962...Peter Serena, Rochester, Dodge.
 46963...J. F. Van Emery, Montgomery, Dodge.
 46964...O. L. Nave, Reno, Ford.
 46965...C. S. Park, Lovelock, Hupmobile.
 46966...H. E. Bathurst, Reno, Ford.
 46967...Mrs. B. T. Sowden, Reno, Chevrolet.
 46968...Percy Train, Manhattan, Hupmobile.
 46969...Frank Curran, Tonopah, Ford.
 46970...John Bingham, Tonopah, Ford.
 46971...C. G. Miller, Sparks, EMF.
 46972...F. E. White, Fallon, Dodge.
 46973...Armstrong & Baker, Fallon, Dodge.
 46974...John Larson, Fallon, Ford.
 46975...Mrs. Fred Andreag, Inlay, Nash.
 46976...R. W. Quinn, Elko, Essex.
 46977...Arthur Drown, Lee, Buick.
 46978...H. B. Lloyd, Round Mtn., Dodge.
 46979...Arthur C. Denton, Reno, Ford.
 46980...Felix Turillias, Reno, Cadillac.
 46981...Bert Ritter, Reno, Maxwell.
 46982...Geo. W. Sears, Reno, Overland.
 46983...Bert Homer, Reno, Pan.
 46984...Joe Allard, Colleville, Ford.
 46985...E. L. Wyatt, Gardnerville, Buick.
 46986...Joseph Gray, Mound House, Ford.
 46987...L. G. Gibson, Reno, Ford.
 46988...J. L. Campbell, Genoa, Studebaker.
 46989...R. M. Dennyngsen, Tonopah, Dodge.
 46990...R. H. McLoughlin, Goldfield, Oldsmo.
 46991...Joseph A. Banerly, Austin, Overland.
 46992...Humbert Clardella, Reno, Studebaker.
 46993...John Belaustragin, Battle Mtn., Ford.
 46994...Lee F. Streeter, Sparks, Chevrolet.
 46995...Davis Oil Shale Co., Reno, Overland.
 46996...E. K. Wright, Clover City, Ford.
 46997...Mrs. Anna Jensen, Sparks, Chevrolet.
 46998...R. S. Madden, Fallon, Ford.
 46999...Phil Bissonnette, Silver Peak, Ford.
 47000...F. D. Quirk, Virginia, Ford.
 47001...J. P. Sparks, Tonopah, Ford.
 47002...P. D. McLeod, Tonopah, Dodge.
 47003...A. A. Buchanan, Tonopah, Ford.
 47004...E. A. Skillman, Eureka, Ford.
 47005...Dr. F. H. Phillips, Reno, Chandler.
 47006...Nevada Rand M. Co., Reno, Oakland.
 47007...John Nichol, Elko, Ford.
 47008...Mrs. Geo. Martin, Tecoma, Hupmobile.
 47009...Alfred Bellander, Baker, Republic.
 47010...John Z. Shalter, Reno, Ford.
 47011...Mark Thomas, Reno, Ford.
 47012...F. M. Steinheimer, Reno, Maxwell.
 47013...R. C. Majors, Sparks, Herreshoff.
 47014...Mrs. L. A. Gibbon, Reno, Oldsmobile.
 47015...Dan McIntyre, Battle Mountain, Ford.
 47016...Geo. Russell, Battle Mountain, Ford.
 47017...Fred Barron, Battle Mountain, Cadillac.
 47018...White Pine Lode Co., Ely, Ford.
 47019...R. D. Chambers, Ely, Ford.
 47020...Ed. Coyle, Currant, Ford.
 47021...Chan Griswold, Elko, Dodge.
 47022...Chas. Hale, Elko, Dodge.
 47023...Mrs. Pau. Guidice, Elko, Chevrolet.
 47024...Thomas Barnes, McGill, Dodge.
 47025...Geo. W. Byers, Deeth, Ford.
 47026...So. Nev. Agr. Bd., Las Vegas, Ford.
 47027...O. W. Taylor, Las Vegas, Ford.
 47028...Billie Robinson, Las Vegas, Gordon-S.
 47029...E. G. Norton, Fallon, Oldsmobile.
 47030...C. A. Ramsey, McGill, Reo.
 47031...Peter Fabbri, Tonopah, Overland.
 47032...Ed. Boblett, Tonopah, Buick.
 47033...Frank J. Crane, Tonopah, Ford.
 47034...Progress Bakery, Tonopah, Ford.
 47035...Gregorio Urritia, Ely, Buick.
 47036...Lucas Ginezex, Schellbourne, Dodge.
 47037...F. B. Matson, Ely, Reo.
 47038...Johnnie Abe, Millett, Ford.
 47039...W. H. Meldrum, Manhattan, Buick.
 47040...C. Kirby, Cherry Creek, Ford.
 47041...F. M. Newgard, Reno, Hudson.
 47042...Groom Mine, Las Vegas, Dodge.
 47043...Groom Mine, Las Vegas, Dodge.
 47044...Fagen Con. M. Co., Mina, Reo.
 47045...Simon Contact M. Co., Mina, Buick.
 47046...Simon S.-L. M. Co., Mina, Pierce-Ar.
 47047...Edith Knippenberg, Carson City, Ford.
 47048...Simon S.-L. M. Co., Mina, Cadillac.
 47049...Doreteo Agorreta, Ely, Hudson.
 47050...Barton Lucas, Reno, Dodge.
 47051...Arthur Knecht, Ely, Ford.
 47052...Wm. S. Bennett, Sparks, Chevrolet.
 47053...Joe Sario, Yerington, Ford.
 47054...Percy Rupp, Tonopah, Ford.
 47055...E. W. Hendrefp, Lund, Ford.
 47056...R. B. Brown, Kimberly, Reo.
 47057...E. O. Dougherty, Tonopah, Ford.
 47058...E. J. Lovett, Arden, Ford.
 47059...Mabel H. Weber, Beowawe, Overland.
 47060...T. R. Weber, Beowawe, Dodge.
 47061...Louie Ock, Eureka, Ford.
 47062...A. J. McDermott, Deeth, Ford.
 47063...J. J. Leavitt, Jr., Mesquite, Ford.
 47064...N. N. Butler, Las Vegas, Ford.
 47065...N. N. Butler, Las Vegas, Ford.
 47066...Carl A. Snider, Las Vegas, Chandler.
 47067...Arthur J. Shaver, Sparks, Ford.
 47068...M. Arbonias, Winnemucca, Mitchell.
 47069...Chas. Recanzone, Paradise, Ford.
 47070...A. F. Tronsdal, Winnemucca, Ford.
 47071...C. E. Kennedy, Winnemucca, Ford.
 47072...Wm. Freemonth, Willow Point, Ford.
 47073...Wm. Freemonth, Willow Point, Reo.
 47074...Pearce Bros., Winnemucca, Ford.
 47075...N. E. Anderson, Mill City, Ford.
 47076...G. Hurtado, Rebel Creek, Ford.
 47077...Sam T. Muldrow, Winnemucca, Ford.
 47078...Owen Swift, Winnemucca, Ford.
 47079...J. F. Aat, Winnemucca, Ford.
 47080...F. B. Stewart, Paradise, Case.
 47081...Joe Iraguen, McDermitt, Ford.
 47082...W. H. Springer, Winnemucca, Ford.
 47083...O. S. Hoffman, Winnemucca, Reo.
 47084...M. Cazajons, Winnemucca, Chevrolet.
 47085...Ernest Brown, Winnemucca, Chevrolet.
 47086...Mrs. L. Abel, Willow Point, Studebaker.
 47087...Anderson & McShae, Winnemucca, Ford.
 47088...A. E. Smith, Winnemucca, Ford.
 47089...Curtis A. True, Amos, Ford.
 47090...Geo. Reed, Paradise, Ford.
 47091...C. E. Swazy, Winnemucca, Chevrolet.
 47092...Holmes & Suttan, Reno, Cadillac.
 47093...Elmer E. Penrod, Fallon, Ford.
 47094...R. W. Roylance, Fallon, Chevrolet.
 47095...H. C. Maxon, Elko, Studebaker.
 47096...Mrs. Hannah Cazier, Currant, Ford.
 47097...Mrs. C. M. Barton, Clover City, Ford.
 47098...H. A. McMurtry, Elko, Ford.
 47099...Floyd Jewkes, Arthur, Studebaker.
 47100...Thomas Japy, Elko, Studebaker.
 47101...R. H. Murphy, Elko, Ford.
 47102...Candelaria M. Co., Candelaria, Ford.
 47103...J. E. Myers, Lamaille, Ford.
 47104...Edw. P. Sellen, Reno, Nash.

- 47105....Candelaria M. Co., Candelaria, Dodge.
 47106....W. J. Swail, Carson City, Ford.
 47107....Mar & Oxford, Yerington, Ford.
 47108....Wm. Robinson, Yerington, Overland.
 47109....W. H. Sanders, Mina, Stearns-Knight.
 47110....Alex Hagay, Jiggs, Chandler.
 47111....C. B. Burr, Fallon, Ford.
 47112....Bert Sales, Fallon, Ford.
 47113....C. W. Smith, Arthur, Studebaker.
 47114....Ely Meat Co., Ely, Ford.
 47115....A. R. Riepe, Ely, Birch.
 47116....Dwight Hood, Reno, Ford.
 47117....E. D. Lake, Flanigan, Ford.
 47118....L. A. Fischer, Manhattan, Ford.
 47119....C. L. Brown, Reno, Chevrolet.
 47120....John Silva, Reno, Chevrolet.
 47121....M. Wm. Pierce, Reno, Chevrolet.
 47122....F. T. Harnedy, Johnnie, Ford.
 47123....Horton Merc. Co., Battle Mtn., Ford.
 47124....C. Grelling, Reno, Cadillac.
 47125....H. C. Stimler, Tonopah, Nash.
 47126....John B. Platts, Hawthorne, Chevrolet.
 47127....Alma M. Hunt, Reno, Chandler.
 47128....Stevens & Thompson, Mason, Chevrolet.
 47129....James M. Hunter, Lovelock, Ford.
 47130....Thos. C. Fradsham, Carson City, Ford.
 47131....Art. Heavner, Ruth, Overland.
 47132....Miguel Zubiri, Schellbourne, Case.
 47133....Fred V. Hook, Ruth, Ford.
 47134....A. E. Lewis & Co., Palisade, Ford.
 47135....Bud Decker, Millett, Chevrolet.
 47136....Mae Parker, Tonopah, Buick.
 47137....R. H. Schwartz, Paradise, GMC.
 47138....G. C. Riser, McGill, Studebaker.
 47139....Claus Olsen, Cherry Creek, Ford.
 47140....R. L. Critchfield, Las Vegas, Overland.
 47141....Walter R. Bracken, Las Vegas, Ford.
 47142....Jack Turner, Goodsprings, Buick.
 47143....C. J. Black, Las Vegas, Ford.
 47144....Isabel Murphy, Pioche, Maxwell.
 47145....Mrs. Ed. J. Decker, Pioche, Ford.
 47146....Eureka L. & S. Co., Eureka, Dodge.
 47147....N. P. Plummer, Palisade, Ford.
 47148....Glen F. Butler, Palisade, Oakland.
 47149....Harry Trott, Lamolille, Oldsmobile.
 47150....Tungsten Comet Co., Panaca, Republic.
 47151....John A. Watts, Wells, Ford.
 47152....E. J. Lyng, Elko, Hudson.
 47153....Ely Ice Mfg. Co., Ely, Republic.
 47154....Ely Ice Mfg. Co., Ely, Vim.
 47155....Angle Abotzes, McDermitt, Buick.
 47156....J. I. Earl, Overton, Ford.
 47157....L. Hawcroft, Reno, Studebaker.
 47158....J. H. Kehoe, Reno, Ford.
 47159....Paul Butler, Flanigan, Ford.
 47160....Homer Price, Reno, Saxon.
 47161....W. R. Clark, Goldfield, Ford.
 47162....Harry O'Brien, Beatty, Ford.
 47163....O. J. Lents, Sparks, Studebaker.
 47164....Romeyn Gregory, Reno, Chevrolet.
 47165....Guy Von Staden, Reno, Dorris.
 47166....O. H. Groth, Reno, Oakland.
 47167....C. M. Hoover, Fallon, Overland.
 47168....C. M. Hoover, Fallon, Chevrolet.
 47169....Gus Welin, Fallon, Ford.
 47170....Ed. Fulstone, Wellington, Ford.
 47171....E. P. Hearn, Reno, Overland.
 47172....Garfield Force, Lovelock, Ford.
 47173....Watt Frazier, McDermitt, Ford.
 47174....Juan Jaca, McDermitt, Buick.
 47175....Silver Peak C. Co., Tonopah, Dodge.
 47176....Walter Scott, McDermitt, Ford.
 47177....R. R. Gamble, Hazen, Ford.
 47178....Henry Larson, Lovelock, Ford.
 47179....M. S. Sweet, Minden, Ford.
 47180....J. E. Godward, Hudson, Ford.
 47181....Nev. Con. T. & T. Co., Carson, Maxwell.
 47182....Joe Jaunsaras, Wellington, Briscoe.
 47183....V. S. Connell, Wellington, Cadillac.
 47184....Horton Merc. Co., Battle Mtn., Chevrol.
 47185....Henry Bassman, Gardnerville, Ford.
 47186....Arthur Walters, Sheridan, Reno.
 47187....Philip Curte, Reno, Chandler.
 47188....J. E. Horton, Goldfield, Ford.
 47189....W. H. Beyer, Goldfield, Ford.
 47190....Travis Darrough, Round Mtn., Ford.
 47191....Chas. Anderson, Tonopah, Dodge.
 47192....Wm. Gutch, Fernley, Chandler.
 47193....Frank Forvilly, Low, Rochester, Ford.
 47194....James L. Coe, Verdi, Reno.
 47195....Mary Avanzino, Reno, Reno.
 47196....Bernard J. Smith, Reno, Ford.
 47197....A. G. Spencer, Reno, Dodge.
 47198....W. W. Freeberg, Reno, Chevrolet.
 47199....J. M. Scott, Reno, Ford.
 47200....E. E. King, Goldfield, Ford.
 47201....V. E. Hamlin, Goodsprings, Ford.
 47202....S. H. Manor, Goldfield, Overland.
 47203....Minnesota-Nev. Co., Yerington, Ford.
 47204....Comrade S. & L. M. Co., Reno, Ford.
 47205....S. H. Baillargeon, Reno, Ford.
 47206....Bert J. Day, Fallon, Overland.
 47207....W. S. Read, Fallon, Ford.
 47208....C. H. Brown, Fallon, Chevrolet.
 47209....Henry Peters, Jiggs, Ford.
 47210....F. C. Hathaway, Fallon, Ford.
 47211....F. L. Rigsby, Ely, Stuts.
 47212....Omer Buchies, Halleck, Ford.
 47213....John Regahl, Wonder, Ford.
 47214....Mrs. S. B. Nay, Las Vegas, Ford.
 47215....H. R. Kolater, Reno, Cadillac.
 47216....A. S. Nichols Co., Reno, Buick.
 47217....Mrs. B. Leon, Reno, Hudson.
 47218....C. R. Beck, Beatty, Ford.
 47219....H. L. Kane, Goldfield, Ford.
 47220....R. McGhee, Como, Chalmers.
 47221....Arthur L. Clark, Hudson, Ford.
 47222....J. Emmett Walsh, Goldfield, Ford.
 47223....Montana-Tonopah M. Co., Tonopah, Fd.
 47224....Fritz Schacht, Dayton, Ford.
 47225....Colby Dodge, Lovelock, Essex.
 47226....Peter Anker, Lovelock, Reno.
 47227....Kirk Geary Co., Reno, Dodge.
 47228....Joseph D. Woods, Reno, Buick.
 47229....Paul Rigli, Simpson, Buick.
 47230....F. Faulkner, Bonnie Clare, Ford.
 47231....C. C. Larson, Lovelock, Ford.
 47232....Robt. Jones, Unionville, Ford.
 47233....C. H. Baker, Lovelock, Ford.
 47234....C. L. Crewe, Fallon, Chevrolet.
 47235....E. W. Stratton, Fairview, Maxwell.
 47236....Wiley M. Vaughn, Fallon, Chevrolet.
 47237....Nicholas G. Jesch, Fallon, Reno.
 47238....G. W. Goff, Goldfield, Ford.
 47239....Matt Hoveck, Tonopah, Overland.
 47240....M. D. Farretta, Battle Mtn., Oakland.
 47241....H. P. Aldrich, Tonopah, Dodge.
 47242....C. A. Clemmons, Tonopah, Hupmobile.
 47243....J. L. Durrett, Battle Mountain, Ford.
 47244....Carlo Cereghino, Beowawe, Chevrolet.
 47245....John Rossi, Cortes, Ford.
 47246....M. B. Tripp, Eureka, Overland.
 47247....M. M. Sperlich, Carlin, Oakland.
 47248....Mrs. Wm. Denio, Gerlach, Dodge.
 47249....R. F. White, Reno, Studebaker.
 47250....C. F. Springer, Reno, Dodge.
 47251....Belcher Div. M. Co., Tonopah, Dodge.
 47252....J. W. Haines, Rawhide, Buick.
 47253....J. F. Landon, Elko, Ford.
 47254....I. E. Wines, Arthur, Buick.
 47255....Clark James, Tonopah, Studebaker.
 47256....L. B. Hylton, Deeth, Buick.
 47257....Ramon Arizabalaga, Fallon, Ford.
 47258....Thos. E. McGarry, Duckwater, Ford.
 47259....P. J. Ogilvie, Lee, Dodge.
 47260....John P. Riordan, Elko, Overland.
 47261....Ysidro Uniola, Tuscarora, Studebaker.
 47262....G. F. McKnight, Elko, Studebaker.
 47263....Charles W. Enke, Elko, Ford.
 47264....John Crosson, Elko, Overland.
 47265....W. M. Carson, Reno, Oakland.
 47266....L. Masini, Sparks, Buick.
 47267....Ed. Lytton, Elko, Buick.
 47268....John Alameda, Fallon, Ford.
 47269....J. W. Swiger, Fallon, Ford.
 47270....Sam Norton, Fallon, Ford.
 47271....Leslie J. Warner, Cobre, Ford.
 47272....Mrs. Bert Nay, Las Vegas, Ford.
 47273....F. W. Fletcher, Cherry Creek, Dodge.
 47274....Alice D. Sirl, Ely, Ford.
 47275....D. C. McDonald, Ely, Ford.
 47276....H. Wold, Reno, Ford.
 47277....Minden Flour Co., Minden, Dorris.
 47278....Minden Flour Co., Minden, Dorris.

47279. Minden Flour Co., Minden, Dorris.
 47280. James Conalli, Genoa, Ford.
 47281. Peter Wihale, Gardnerville, Buick.
 47282. Geo. Kennedy, Elko, Ford.
 47283. Jack Armistead, Lee, Ford.
 47284. C. A. Liddell, Tonopah, Chevrolet.
 47285. General Cameras Corp., Reno, Buick.
 47286. Nevada State Police, Carson, Dodge.
 47287. J. B. Lamb, Reno, Ford.
 47288. Dan Maysey, Reno, Ford.
 47289. J. D. Montgomery, Manhattan, Ford.
 47290. John Reynolds, Columbia, Ford.
 47291. H. A. Geisendorfer, Tonopah, Oakland.
 47292. Geo. H. Kent, Tonopah, Dodge.
 47293. R. Tank, Carlin, Studebaker.
 47294. Walter Van Eaton, Arthur, Ford.
 47295. A. L. Wood, Wells, Overland.
 47296. Helen Gaynor Bedford, Reno, Buick.
 47297. S. Lampa & Co., Ione, Oldsmobile.
 47298. Warden Smith, Sheephead, Buick.
 47299. Floyd Cable, Goldfield, Buick.
 47300. G. L. Diefenbaugh, Goldfield, Ford.
 47301. Dove Pugh, Lovelock, Chevrolet.
 47302. H. Raycraft, Carson City, Ford.
 47303. Consumers Mut. Union, Reno, Dodge.
 47304. I. Papathatos, Reno, Ford.
 47305. Alex Anderson, Tonopah, Ford.
 47306. Edward Peterson, Tonopah, Dodge.
 47307. J. Selby Badt, Wells, Pierce-Arrow.
 47308. J. C. Walker, Rand, Ford.
 47309. E. W. Holesworth, Reno, Maxwell.
 47310. John Yrasaqui, Elko, Hudson.
 47311. August Kaiser, Carson City, Ford.
 47312. Steve James, Reno, Ford.
 47313. G. B. Day, Simpson, Dodge.
 47314. S. C. Shirley, Elko, Hudson.
 47315. W. M. Heard, Battle Mtn., Overland.
 47316. Richard M. Haaga, Battle Mtn., Ford.
 47317. G. W. Rockwell, Tonopah, Oakland.
 47318. Nick Paul, Ruth, Studebaker.
 47319. G. G. Brooks, McGill, Ford.
 47320. J. M. Carl Hornsilver, Ford.
 47321. Standard Oil Co., Elko, Mack.
 47322. Standard Oil Co., Elko, Ford.
 47323. Mrs. F. L. Waltze, Verdi, Ford.
 47324. C. M. Henningsen, Gardnerville, Buick.
 47325. E. B. Aubrey, Minden, Ford.
 47326. Thos. J. Marks, Virginia, Reo.
 47327. Anna W. Bradley, Winnemucca, Ford.
 47328. Anna W. Bradley, Winnemucca, Ford.
 47329. Ed. Stock, Paradise, Studebaker.
 47330. Miss Gemma Pasquale, Paradise, Chev.
 47331. Mrs. J. B. Fordin, Winnemucca, Mitch.
 47332. D. E. McCarty, Winnemucca, Ford.
 47333. A. T. Lay, Sulphur, Ford.
 47334. Mrs. Etta Baker, Winnemucca, Ford.
 47335. U. N. I. T. Co., Winnemucca, Ford.
 47336. Dr. M. E. Morrison, Winnemucca, Buick.
 47337. E. B. Thompson, Winnemucca, Ford.
 47338. Julius Larrabee, Winnemucca, Olds.
 47339. Sunshine Mines Co., Winnemucca, Reo.
 47340. A. E. Organ, Winnemucca, Overland.
 47341. James Gladding, Mound House, Max.
 47342. Chas. Kinney, Wellington, Chevrolet.
 47343. Xerxes Martin, Lee, Dodge.
 47344. Geo. W. Selby, Genoa, Ford.
 47345. Guilfo Teglia, Dayton, Haynes.
 47346. Lyn Botts, Tonopah, Ford.
 47347. W. H. Morgan, Wichman, Dodge.
 47348. A. B. Barnum, Ely, Ford.
 47349. H. W. Edwards, Ely, Page.
 47350. O. H. Goodale, Ruth, Ford.
 47351. B. M. Swope, Cherry Creek, Maxwell.
 47352. Ferrol Hunting, Cherry Creek, Ford.
 47353. P. F. McDermott, Goldfield, Ford.
 47354. C. L. Davis, Tonopah, King.
 47355. Hy West, Reno, Chevrolet.
 47356. Joseph Lang, Elko, Studebaker.
 47357. Joe Kendall, Goldfield, Ford.
 47358. J. B. Wheeler, Pioche, Ford.
 47359. Thomas King, McGill, Ford.
 47360. Harry Hermann, Las Vegas, Overland.
 47361. Frank Goodale, McGill, Ford.
 47362. Ernest B. Wanke, Sparks, Ford.
 47363. George W. Thompson, Goldfield, Over.
 47364. H. H. Hudson, Tonopah, Hup.
 47365. W. D. Kemp, McGill, Ford.
 47366. Omer Maris, Manhattan, Ford.
 47367. Karl Hoff, Midas, Ford.
 47368. E. Reinhardt Co., Winnemucca, Ford.
 47369. Jesse M. Rhodes, Reno, Reo.
 47370. S. E. Montgomery, Reno, Chevrolet.
 47371. John Herger, Genoa, Ford.
 47372. Walter Long, Pioche, Buick.
 47373. W. F. West, Irapah, Utah, Buick.
 47374. Sloan Wm. Lewis, McGill, Ford.
 47375. Ray O. Allison, Reno, Ford.
 47376. Arrascada Bros., Elko, Ford.
 47377. John W. Garrett, Tonopah, Dodge.
 47378. C. Barengo, Reno, Pilot.
 47379. B. E. McKenna, Nelson, Ford.
 47380. E. E. Watson, Sparks, Studebaker.
 47381. W. J. Cremers, Reno, Buick.
 47382. Arthur Shaw, Yerington, Samson.
 47383. J. H. Peckham, Rochester, Ford.
 47384. Fred & Chas. Kitzmeyer, Carson, Huds.
 47385. W. L. Jones, Overton, Ford.
 47386. A. E. Reynolds, Yerington, Ford.
 47387. J. P. O'Neil, Wells, Chandler.
 47388. O'Neil Bros., Wells, Oldsmobile.
 47389. O'Neil Bros., Wells, Kissel Kar.
 47390. Bert Mills, Logandale, Ford.
 47391. R. M. Woodward, Tuscarora, Dodge.
 47392. K.C.-Nev. Con. M. Co., Bruner, Federal.
 47393. W. N. Curto, Ely, Ford.
 47394. A. Weihumster, Cedarville, Cal., Dodge.
 47395. Walter Hansen, Reno, Chevrolet.
 47396. John R. Cook, Pioche, Ford.
 47397. Harold A. Maier, McGill, Chevrolet.
 47398. J. N. Phillips, Tuscarora, Kissel.
 47399. Mrs. Kate Frisbie, Carson, Studebaker.
 47400. Mrs. Fred Spangenberg, Carson, Ford.
 47401. Mrs. Lulu Caraway, Reno, Ford.
 47402. A. M. Mayett, Manhattan, Ford.
 47403. E. J. Bridges, Packard, Dodge.
 47404. A. G. Caughlin, Reno, Dodge.
 47405. John P. Dodge, Reno, Ford.
 47406. Robert Anderson, Deeth, Oldsmobile.
 47407. S. T. Wines, Ruby Valley, Oakland.
 47408. W. F. Parsons, O'Neil, Oldsmobile.
 47409. Arthur Griswold, Arthur, Oakland.
 47410. Lawrence Anderson, Deeth, Oldsmobile.
 47411. John Griswold, Arthur, Oldsmobile.
 47412. Jake Reed, Tuscarora, Oldsmobile.
 47413. C. B. Hood, Elko, Oldsmobile.
 47414. Ernest Wood, Wells, Oldsmobile.
 47415. Charley Howard, North Ford, Olds.
 47416. J. F. Rumbaugh, East Ely, Chevrolet.
 47417. W. E. Hutchings, Lund, Ford.
 47418. H. E. R. Freeman, Ruth, Oakland.
 47419. W. S. Holmquist, Ely, Ford.
 47420. E. R. Allred, Tonopah, Ford.
 47421. Lew Fedler, Kimberly, Ford.
 47422. O. E. O'Hara, East Ely, Ford.
 47423. C. J. Goodall, Kimberly, Ford.
 47424. Mrs. S. M. Campbell, Ely, Chevrolet.
 47425. Martin Madsen, Ely, Dodge.
 47426. L. R. McKenzie, Verdi, Oldsmobile.
 47427. C. E. Franklin, Amos, Ford.
 47428. J. W. Stauffer, Reno, Chevrolet.
 47429. George M. Smitten, Fallon, Chevrolet.
 47430. Angelo Baccara, Jiggs, Ford.
 47431. C. A. Ernst, Unionville, Ford.
 47432. George Smith, Arthur, Studebaker.
 47433. George Lewis, Fallon, Ford.
 47434. Geo. P. Armstrong, Reno, Reo.
 47435. James Green, Dyer, Ford.
 47436. Ward Martin, Lovelock, Ford.
 47437. Lovelock Honey Co., Lovelock, Ford.
 47438. W. H. Bond, Beatty, Parry.
 47439. R. H. Oakley, Yerington, Cleveland.
 47440. Desert Forwarding Co., Tonopah, Nash.
 47441. Desert Forwarding Co., Tonopah, Nash.
 47442. Mike Lostra, Elko, Studebaker.
 47443. F. H. Luhrs, Carson City, Ford.
 47444. Pacific Tungsten Co., Mill City, Ford.
 47445. Mrs. L. B. Olds, Wellington, Chevrolet.
 47446. Dave Sutherland, Fallon, Ford.
 47447. James Constable, Reno, Ford.
 47448. T. R. Hofer, Jr., Reno, Hupmobile.
 47449. Mrs. T. W. Randolph, Halleck, Ford.
 47450. Paul Nikolaus, Wabuska, Stephens.
 47451. Paul Etcheberry, Austin, Overland.
 47452. Austin Dakota Dev. Co., Austin, Ford.

- 47453...E. C. Smith, Wells, Oakland.
 47454...Murray Sheep Co., Burbank, Utah, Rep.
 47455...Murray Sheep Co., Burbank, Utah, Rep.
 47456...W. E. Licking, Battle Mtn., Maxwell.
 47457...Oliver Watt, Battle Mtn., Dodge.
 47458...Mildred James, Manhattan, Hupmobile.
 47459...Wells Williams, Reno, Buick.
 47460...Geo. C. Bias, Lamolite, Ford.
 47461...A. Devere, Sparks, Chevrolet.
 47462...Toyuro Sakahara, Sparks, G. Western.
 47463...Beatrice Rosewear, Hamilton, Ford.
 47464...Pioche Mines Co., Pioche, Jeffrey.
 47465...John H. Degenar, Fallon, Chevrolet.
 47466...E. M. Parsons, Fallon, Studebaker.
 47467...Lew Broadway, Stillwater, Ford.
 47468...John L. Coot, Midas, Republic.
 47469...J. P. Schopper, Reno, Ford.
 47470...W. H. Supp, Wells, Ford.
 47471...St. Bd. Stock Com., Reno, Dodge.
 47472...Gladys M. Wagner, Sparks, Overland.
 47473...Steve Williams, Reno, Chevrolet.
 47474...Albert Paenner, Pioche, Ford.
 47475...Mrs. A. P. Denning, Las Vegas, Ford.
 47476...Chas. Downing, Mt. Montgomery, Ford.
 47477...Dr. P. H. Phillips, Reno, National.
 47478...Mrs. Julia Parry, Reno, Essex.
 47479...Ingersoll Rand Co., Tonopah, Dodge.
 47480...M. L. Shanafelt, Tonopah, Mitchell.
 47481...Francis E. Lewis, Ely, Maxwell.
 47482...Manuel Erro, Lamolite, Dodge.
 47483...O. C. Biddle, Elko, Dodge.
 47484...Paul Rose, Reno, Hupmobile.
 47485...H. J. Woodward, Las Vegas, Ford.
 47486...Elmer Johnson, Las Vegas, Chevrolet.
 47487...Harry Aronson, Reno, Mitchell.
 47488...H. P. Bias, McGill, Ford.
 47489...Wm. Chinn, McGill, Ford.
 47490...Phillip Dolan, Pioche, Ford.
 47491...Olachesa Bros, Ely, Chandler.
 47492...Olachesa Bros, Ely, Hupmobile.
 47493...T. T. Fairchild, Tuscarora, Ford.
 47494...T. T. Fairchild, Tuscarora, Cadillac.
 47495...Geo. Hussman, Gardnerville, Ford.
 47496...Louis Ruhenstrath, Gardnerville, Buick.
 47497...Henry Scheele, Gardnerville, Overland.
 47498...Nevada Ophir M. Co., Tonopah, Buick.
 47499...L. W. Engliert, Elko, Dodge.
 47500...Earl Ennor, Elko, Cleveland.
 47501...A. W. Kundson, Elko, Dodge.
 47502...Guy Brown, Elko, Dodge.
 47503...Maude Erwin, Reno, Interstate.
 47504...Frank J. Belvoar, Elko, Chevrolet.
 47505...Review Silver M. Co., Carson, Ford.
 47506...W. E. Wald, Reno, Saxon.
 47507...Willie Wong, Golconda, Overland.
 47508...W. H. Snyder, Goldfield, Overland.
 47509...J. H. Polander, Denio, Oreg., Ford.
 47510...Wm. Anderson, Tonopah, Ford.
 47511...H. J. Howard, Tonopah, Ford.
 47512...Arrowhead Mining Co., Tonopah, Ford.
 47513...Lawrence Masini, Yerington, Ford.
 47514...Frank Rasaschi, Yerington, Nash.
 47515...Angelo Lynch, Pioche, Ford.
 47516...Johnnie Blossom, Battle Mtn., Ford.
 47517...S. C. & S. J. Weeks, Wells, Buick.
 47518...S. C. & S. J. Weeks, Wells, Oldsmobile.
 47519...T. E. Frederick, Reno, Oldsmobile.
 47520...Sol Camp, Goldfield, Ford.
 47521...Otis Fulk, Reno, Ford.
 47522...Angelo Guilici, Sparks, Mitchell.
 47523...Ed. Greiner, Reno, Reo.
 47524...Guilio Farnucci, Yerington, Chevrolet.
 47525...Mrs. J. M. Woodward, Goldfield, Buick.
 47526...Gus. Benson, Reno, Buick.
 47527...C. F. LeLannoy, Dayton, Ford.
 47528...Capitol Garage, Carson, Studebaker.
 47529...M. Shirley, Carson, Saxon.
 47530...H. G. Rider, Reno, Buick.
 47531...O. S. Coates, Searchlight, Ford.
 47532...Nevada Farm Bureau, Elko, Ford.
 47533...Solid Metals M. & L. Co., Reno, Ford.
 47534...R. C. Dodge, Fallon, Hupmobile.
 47535...H. M. Parsons, Sparks, Overland.
 47536...Alfred Martel, Jr., Tonopah, Ford.
 47537...Nevada Honey Co., Yerington, Olds.
 47538...W. L. Wilkinson, Winnemucca, Cadillac.
 47539...Martin Oyarcabal, Amos, Ford.
 47540...P. Mirandeborde, Winnemucca, Reo.
 47541...S. Siard, Winnemucca, Buick.
 47542...S. Siard, Winnemucca, Federal.
 47543...S. Siard, Winnemucca, Reo.
 47544...S. Siard, Winnemucca, Hupmobile.
 47545...E. G. Thomsen, Winnemucca, Ford.
 47546...W. K. Eberling, Denio, Oreg., Ford.
 47547...Pacific Livestock Co., Amos, Ford.
 47548...Pete Etchart, Jungo, Oldsmobile.
 47549...Jesus Aranguena, Winnemucca, Ford.
 47550...A. J. Barmess, Amos, Ford.
 47551...W. L. Akin, Winnemucca, Overland.
 47552...A. B. Fowler, Amos, Ford.
 47553...I. B. Beeson, Denio, Oreg., Reo.
 47554...F. M. Payne, Amos, Ford.
 47555...Simon Laas, McDermitt, Buick.
 47556...Antone Ramasco, Paradise, Ford.
 47557...Marion Williamsen, McGill, Jeffery.
 47558...W. R. Tucker, Carson, Buick.
 47559...U. S. Forest Service, Minden, Reo.
 47560...Mattie Cannon, Reno, Ford.
 47561...H. Taunt, Franktown, Laund.
 47562...W. E. Brennan, Battle Mtn., Ford.
 47563...Wm. Trembath, Tuscarora, Ford.
 47564...R. W. Robinson, Fallon, Dodge.
 47565...Horace Cross, Panaca, Ford.
 47566...W. H. Cross, Reno, Ford.
 47567...H. L. Tuttle, Wells, Chevrolet.
 47568...Odgers Bros., Currie, Dodge.
 47569...J. C. Hoxie, Searchlight, Overland.
 47570...John McDermott, Deeth, Ford.
 47571...R. W. McVicar, Smith, Reo.
 47572...Leon Bony, Verdi, Chandler.
 47573...J. E. Burch, Pahump, Saxon 6.
 47574...E. L. Drappo, Reno, Cadillac.
 47575...Fisk Rubber Co., Reno, Overland.
 47576...M. A. Bianchi, Battle Mtn., Overland.
 47577...Mrs. Englebright, Eureka, Ford.
 47578...C. H. Woodruff, Carlin, Ford.
 47579...Joe McMaster, Ely, Ford.
 47580...Albert Wittwer, Bunkerville, Ford.
 47581...J. P. Jeppesen, Ely, Ford.
 47582...G. E. Weathers, Deeth, Overland.
 47583...Martin Tomstad, Reno, Ford.
 47584...Denver Rock Drill Co., Tonopah, Ford.
 47585...G. A. Goodwin, Las Vegas, King 8.
 47586...E. R. Mattinson, Reno, Ford.
 47587...Gray, Reid, Wright Co., Reno, Ford.
 47588...A. C. Barr, Ely, Buick.
 47589...Forest G. Vance, Fernley, Ford.
 47590...Annie Smith, Sparks, Chevrolet.
 47591...James Dysart, Elko, Oldsmobile.
 47592...W. H. Montgomery, Mina, Buick.
 47593...John B. Dunstan, Austin, Ford.
 47594...John B. Dunstan, Austin, Ford.
 47595...Frank Snyder, Ely, Ford.
 47596...R. D. McKenzie, Lund, Maxwell.
 47597...Jerry Kent, Ely, Chevrolet.
 47598...Andy Dietlof, Schellbourne, Ford.
 47599...A. DeGrossier, Carson, Buick.
 47600...Wm. McKnight, Tonopah, Chevrolet.
 47601...A. N. Saliabury, Reno, Oldsmobile.
 47602...A. H. MacDonald, Reno, Franklin.
 47603...Ira L. Millap, Sparks, Overland.
 47604...Andrew Nelson, Reno, Studebaker.
 47605...T. J. McMillan, O'Neil, Dodge.
 47606...C. J. Miller, Reno, Cadillac.
 47607...Nutting & Meacham, Sparks, Ford.
 47608...Mrs. Ed. Regan, Reno, Oakland.
 47609...Con. Wagon & Mach. Co., Wells, Ford.
 47610...Leslie E. Johnson, Wells, Hupmobile.
 47611...C. R. Cummings, Montello, Ford.
 47612...S. L. Cordingly, Montello, Ford.
 47613...Ema J. J. W. Marble, Reno, Reo.
 47614...H. McConnell, Cedarville, Cal., Stude.
 47615...David Fisher, Reno, Overland.
 47616...Alfred Smith, Reno, Chalmers.
 47617...A. J. Stinson, Carson, Cadillac.
 47618...Ralph S. Benton, Brawley, Cal., Cad.
 47619...A. L. Kramer, Sparks, Ford.
 47620...Omer Maris, Manhattan, Ford.
 47621...Carl Enslin, Reno, Ford.
 47622...Frandsen & Jensen, Reno, Ford.
 47623...Haley F. Jones, Fallon, Ford.
 47624...Frank C. Hill, Fallon, Ford.
 47625...Nev. Western G. & S. M. Co., Reno, Ford.
 47626...American Tobacco Co., Tonopah, Ford.

- 47627...D. Depoli, Sparks, Mitchell.
 47628...M. H. McNomee, Elko, Samson.
 47629...Wm. McKinney, North Fork, Ford.
 47630...Grant Smith, Baker, Ford.
 47631...B. P. Hockman, Baker, Ford.
 47632...N. B. Nelson, Reno, Reo.
 47633...David Fife, Tonopah, Ford.
 47634...Frank Baglin, Gold Hill, Ford.
 47635...Mrs. C. A. Perrine, Goldfield, Overland.
 47636...C. C. Turner, Wellington, Oakland.
 47637...Ernest Galloway, Virginia, Ford.
 47638...L. E. Allard, Sparks, Ford.
 47639...Ray Knight, Reno, Paige.
 47640...F. M. Steinheimer, Reno, Buick.
 47641...Mark Walser, Reno, Ford.
 47642...Nev. Hdw. & Imp. Co., Reno, Olds.
 47643...C. T. Batto, Reno, Ford.
 47644...John Baby, Kimberly, Reo.
 47645...Albert Drow, Reno, Haynes.
 47646...E. A. Perez, Lovelock, Reo.
 47647...W. D. Clark, Fallon, Stod.-Dayton.
 47648...B. A. Bohne, Arthur, Ford.
 47649...T. H. Lisby, Tuscarora, Overland.
 47650...Chas. Kyle, Reno, Ford.
 47651...Joe Bean, Mina, Ford.
 47652...Geo. H. Copley, Imlay, Ford.
 47653...Geo. H. Copley, Imlay, Ford.
 47654...Geo. H. Copley, Imlay, Ford.
 47655...J. I. Case Co., Reno, Ford.
 47656...John S. Millett, Beatty, Ford.
 47657...Chas. Zuzallo, Tonopah, Overland.
 47658...Mrs. G. K. Maines, Reno, Dodge.
 47659...Ennis Brown Co., Reno, Dodge.
 47660...John Inman, Silver Peak, Buick.
 47661...Frank Smith, Beatty, Studebaker.
 47662...Arthur L. Cox, Tonopah, Chevrolet.
 47663...Dr. A. L. Stadtherr, Reno, Oldsmobile.
 47664...Jerry Yragin, Strawberry, Hudson.
 47665...Jos. Hutchinson, Metropolis, Ford.
 47666...Elmer Middleton, Pioche, Ford.
 47667...Victor Mattenei, Las Vegas, Ford.
 47668...M. Kagakami, Fallon, Ford.
 47669...E. K. Hansen, Lovelock, Reo.
 47670...Will F. Robinson, Reno, Reo.
 47671...Joe Camp, Fernley, Ford.
 47672...Levi Syphus, Jean, Chevrolet.
 47673...G. O. Snelson, Elko, Olds.
 47674...Mrs. J. A. Yocum, Wichman, Ford.
 47675...John Riemiller, Reno, Buick.
 47676...Nevada Packing Co., Reno, Dodge.
 47677...C. E. Saviers, Reno, Buick.
 47678...A. C. Smith, Reno, Overland.
 47679...Frank Gomes, Smith, Hupmobile.
 47680...Ed. Raycraft, Gardnerville, Dodge.
 47681...Michael Nagy, Reno, Dorris.
 47682...Albert Schragle, Tonopah, Ford.
 47683...C. F. O'Brien, Tonopah, Overland.
 47684...Evans M. & M. Co., Las Vegas, Ford.
 47685...W. P. Ross, Reno, Winton.
 47686...J. C. Wholey, Battle Mtn., Ford.
 47687...W. H. Rice, Reno, Ford.
 47688...Labontan Oil Synd., Salt Wells, Ford.
 47689...Geo. W. Chin, Reno, Ford.
 47690...Washoe Co. Farm Bureau, Reno, Ford.
 47691...D. M. Logsdon, Reno, Ford.
 47692...White Pine E. Co., Cherry Creek, Ford.
 47693...Oscar S. Scott, Searchlight, Dodge.
 47694...Wm. Borda, Gardnerville, Chevrolet.
 47695...Lester Jones, Gardnerville, Overland.
 47696...W. W. Booth, Jr., Tonopah, Ford.
 47697...F. P. Fleming, Las Vegas, Studebaker.
 47698...F. Deionghamps, Reno, Buick.
 47699...W. W. Lindsay, Carson, Chevrolet.
 47700...E. D. Walti, Tonkin, Ford.
 47701...Carolyn E. Anthony, Reno, Overland.
 47702...E. C. Short, Reno, Ford.
 47703...Live Poultry Market, Reno, Ford.
 47704...Weaver Oil Co., Fallon, Samson.
 47705...Southeastern M. Co., Las Vegas, Dodge.
 47706...Southeastern M. Co., Las Vegas, Ford.
 47707...Manuel Gomaz, Fernley, Ford.
 47708...Jim Betts, Elko, Ford.
 47709...G. Crawford, Tonopah, Buick.
 47710...Mrs. Anna Mullens, Tonopah, Hup.
 47711...C. H. Spencer, Austin, Chevrolet.
 47712...C. F. Minster, Fallon, Maxwell.
 47713...P. J. Wollman, Ruby Valley, Ford.
 47714...Mrs. Mary C. Franzman, Reno, Dodge.
 47715...C. E. Skidmore, Fallon, Ford.
 47716...A. G. Ward, Reno, Ford.
 47717...A. Bevaqua, Reno, Republic.
 47718...J. C. Cannon, Goldfield, Buick.
 47719...Yellow Tiger M. Co., Goldfield, Republic.
 47720...Joe Beano, Mina, Buick.
 47721...Mrs. Jno. Snyder, Yerington, Dodge.
 47722...G. R. Strand, Reno, Studebaker.
 47723...Elko-Lamolle Power Co., Elko, Cad.
 47724...Nevada H. & P. Co., Reno, Ford.
 47725...Chas. Culverwell, Pioche, Dodge.
 47726...Chas. Culverwell, Pioche, Ford.
 47727...Culverwell Bros., Caliente, Ford.
 47728...R. Schultz, Lovelock, Ford.
 47729...Baptist Lordi, McDermott, Overland.
 47730...Mrs. B. H. Hill, Lovelock, Liberty.
 47731...Jowa L. & C. Co., Lovelock, Buick.
 47732...Martin Legazar, Amos, Ford.
 47733...Joe Lorenzana, Winnemucca, Ford.
 47734...Mrs. J. Raymond, Willow Point, Ford.
 47735...D. F. Abel, Winnemucca, Ford.
 47736...R. M. Case, Winnemucca, Ford.
 47737...W. C. McLosky, Amos, Ford.
 47738...R. M. Case, Winnemucca, Ford.
 47739...Ed. McGhee, Winnemucca, Elcar.
 47740...C. B. Brown, Winnemucca, Buick.
 47741...Victor Zubieta, Amos, Reo.
 47742...F. Germain, Winnemucca, Dodge.
 47743...E. R. Wells, San Jose, Cal., Ford.
 47744...Mrs. Nettie Salls, Gold Creek, Chevrolet.
 47745...W. B. Griffith & Son, Tuscarora, Ford.
 47746...Karl Banks, Panama, Ford.
 47747...Gottfrid Isakson, Tonopah, Ford.
 47748...Dept. of Highways, Las Vegas, Ford.
 47749...Dept. of Highways, Las Vegas, N. Quad.
 47750...Dept. of Highways, Las Vegas, N. Quad.
 47751...Dept. of Highways, Las Vegas, N. Quad.
 47752...Dept. of Highways, Las Vegas, N. Quad.
 47753...M. S. Jones, Steamboat, Chevrolet.
 47754...C. Wallace, Reno, Chevrolet.
 47755...Guy Leach, Reno, Chevrolet.
 47756...J. A. Ruland, Reno, Overland.
 47757...Wm. H. Murray, Reno, Ford.
 47758...E. Voelioti, Reno, Chalmers.
 47759...Effe M. Jennison, Fallon, Ford.
 47760...Alfred C. Miller, Arden, Ford.
 47761...W. W. Grav, Packard, Ford.
 47762...C. F. Lee, Montello, Ford.
 47763...W. J. Tobin, Pioneer, Chandler.
 47764...Walter V. Newell, Wellington, Chandler.
 47765...Neil West, Reno, Chandler.
 47766...Geo. H. Bowler, Mesquite, Ford.
 47767...Carlo Ferretti, Millers, Ford.
 47768...Ed. Springmeyer, Gardnerville, Dodge.
 47769...Morris Ciomi, Yerington, Ford.
 47770...Martin Tremble, Goldfield, Ford.
 47771...H. J. Kaul, Tonopah, Hupmobile.
 47772...J. F. Henry, Goldfield, Saxon.
 47773...Charlotte M. Hamlyn, Beowawe, Ford.
 47774...Mrs. Leta T. Bliss, Carson City, Ford.
 47775...Thos. Lythroe, Elko, Overland.
 47776...W. G. Greathouse, Elko, Studebaker.
 47777...Joseph C. Hendricks, Reno, Buick.
 47778...Jacob Conrad, Lamolle, Maxwell.
 47779...Geo. V. Steninger, Oreana, Buick.
 47780...F. Sangonetti, Reno, Saxon.
 47781...O. R. Guile, Reno, Empire.
 47782...L. J. Hudson, Fallon, Dort.
 47783...G. L. DeVilliers, Montello, Ford.
 47784...G. L. Swartz, Elko, Studebaker.
 47785...A. M. Collini, McGill, Buick.
 47786...Sam Hiller, Hiller, Chevrolet.
 47787...A. Del Papa, Tonopah, Ford.

TRANSFERRED LICENSES

Licenses have been transferred to names set opposite the license numbers as follows:

Make of vehicle is given last.

40070.....Mrs. G. D. Wolfensparger, Reno, Chand.	42549.....John Cobban, Sunnyside, Ford.
40078.....W. M. Gardiner, Reno, Studebaker.	42648.....Louis Zurflieh, Washoe, Nash.
40152.....E. M. Wilson, Fallon, Chevrolet.	42840.....Dr. H. A. Fordyce, Reno, Buick.
40298.....A. L. Borcharding, Tonopah, Overland.	43254.....Frank F. Lopes, Lovelock, Ford.
40346.....Emil Peraldo, Paradise, Dodge.	43392.....Nevada Grocery, Reno, Ford.
40511.....J. P. Kennison, Tonopah, Oakland.	43410.....Geo. Gardiner, Yerington, Dodge.
40707.....C. E. Judd, Reno, Ford.	43518.....Parley Johnson, Kimberly, Buick.
40726.....Lost in transit. See 46017.	43755.....W. H. Jenne, Wadsworth, Ford.
40789.....Mrs. Edna M. Furlong, Elko, Oakland.	43876.....H. M. Gulling, Yerington, Buick.
41123.....E. Reinhart Co., Winnemucca, Internat.	44973.....Dale B. Pruett, Carson, Studebaker.
41189.....Sam Wingfield, Fallon, Chevrolet.	45153.....Roy Daniels, Austin, Overland.
41220.....John Ross, Yerington, Oakland.	45224.....Newton E. Potter, Reno, Ford.
41554.....R. L. McNett, Tonopah, Ford.	45882.....Lincoln Cunningham, Tonopah, M.
41678.....J. L. Woolman, Reno, Dodge.	46017.....Jos. H. Arthur, Reno, Chevrolet.
41877.....R. Raymond, Reno, Chandler.	46171.....C. E. Roberts, Reno, Ford.
42068.....Harvey Majors, Reno, Chevrolet.	46173.....A. L. Rainier, Reno, Ford.
42144.....C. E. Barron, Carson City, Oldsmobile.	46178.....Benedict & Ruddell, Lovelock, Ford.
42307.....Dale V. Clanton, Reno, Ford.	46328.....Ed. A. Ducker, Carson City, Hudson.
42491.....M. L. Soper, Fernley, Maxwell.	46740.....R. A. Rickard, Reno, Ford.
42548.....Dr. Wm. A. Blanch, Minden, Chandler.	46967.....Russel Trathen, Reno, Chevrolet.

LIST OF MOTORCYCLE LICENSES FOR QUARTER ENDING MARCH 31, 1920

Make of vehicle is given last.

1401. E. S. Lee, Las Vegas, Harley-Davidson.	1450. I. A. Weihe, Sparks, Indian.
1402. H. W. Capper, Reno, Indian.	1451. O. H. Swasey, Lovelock, Har-Dav.
1403. R. A. Ricketts, Mason, Henderson.	1452. Newman Supply Co., Elko, Indian.
1404. J. T. Ryan, Reno, Indian.	1453. George R. Emery, Reno, Excelsior.
1405. Truckee River G. E. Co., Reno, Indian.	1454. Albert Mason, Hazen, Indian.
1406. Frank Freitas, Yerington, Indian.	1455. Bruce P. Steiner, Sparks, Indian.
1407. Harvey B. Child, Reno, Indian.	1456. A. W. Morrian, Reno, Indian.
1408. Joe Pelizzari, Reno, Indian.	1457. George K. Ramsey, Reno, Indian.
1409. Tony Freitas, Yerington, Indian.	1458. Otway Shaw, Winnemucca, Indian.
1410. Wallace Cook, Ely, Harley-Davidson.	1459. Ned Carson, Reno, Indian.
1411. Standard Oil Co., Reno, Indian.	1460. V. Martellacci, Sparks, Har-Dav.
1412. Lee LeMasters, Reno, Cleveland.	1461. N. F. Petersen, Reno, Indian.
1413. E. B. Powell, Reno, Indian.	1462. William McLean, Tonopah, Indian.
1414. Mr. Butler, Reno, Indian.	1463. E. J. Sedze, Yerington, Har-Dav.
1415. Louis Berrum, Moana Springs, Indian.	1464. John M. Trapp, Carson, Indian.
1416. Lee A. McDonald, Reno, Har-Dav.	1465. Melvin F. Phillips, Carson, Har-Dav.
1417. Washoe County, Reno, Har-Dav.	1466. Adrian Roberts, Reno, Indian.
1418. Walter Pickrell, Reno, Indian.	1467. John R. Bryan, Reno, Indian.
1419. Gilbert M. Bullock, Reno, Har-Dav.	1468. R. Thomson, Carlin, Har-Dav.
1420. L. W. Newman, Sparks, Har-Dav.	1469. B. J. McVicar, Wellington, Indian.
1421. R. H. Roberts, Wells, Indian.	1470. Johnnie Decker, Round Mtn., Indian.
1422. P. Montecelli, Dayton, Thor.	1471. Frank Kelly, Reno, Henderson.
1423. B. O. Woosty, Smith, Har-Dav.	1472. Standard Oil Co., Reno, Indian.
1424. George C. Evans, Reno, Har-Dav.	1473. H. A. Johannessen, Sparks, Har-Dav.
1425. Edward Graff, Reno, Cleveland.	1474. Alvin M. Watson, McGill, Indian.
1426. Theo. Ascargorta, Ione, Indian.	1475. Gregoria Logaspi, Reno, Har-Dav.
1427. Arthur H. Randall, Dayton, Indian.	1476. Wm. Norris, Reno, Indian.
1428. Ralph E. Clay, Reno, Har-Dav.	1477. Louis Serpentino, Reno, Indian.
1429. A. W. Swan, Reno, Indian.	1478. Prof. B. M. Hansen, Reno, Cleveland.
1430. Arthur J. Purcell, Mina, Indian.	1479. Pete Bondanza, Verdi, Indian.
1431. J. L. Linqvist, McGill, Read-Stand.	1480. Lawrence Semenza, Reno, Har-Dav.
1432. Edward Smith, Jr., Fallon, Har-Dav.	1481. W. H. Oden, Reno, Indian.
1433. W. A. Mundy, Las Vegas, Har-Dav.	1482. John Pacheco, Carson, Har-Dav.
1434. E. B. Gregory, Reno, Henderson.	1483. J. R. Hughes, Reno, Har-Dav.
1435. E. J. Luce, McGill, Henderson.	1484. Leslie Marker, Lovelock, Indian.
1436. John Pagni, Dayton, Har-Dav.	1485. Wm. Keyes, Wabuska, Excelsior.
1437. H. J. Anderson, Reno, Shaw.	1486. Stanley Martin, Yerington, Indian.
1438. Earl R. Hammond, Reno, Indian.	1487. Harold Morby, McGill, Harley-Dav.
1439. L. C. Savage, Reno, Indian.	1488. John E. Richards, Tonopah, Har-Dav.
1440. R. Tortorollo, Verdi, Read-Stand.	1489. Theoroda Marchio, Wabuska, Excelsior.
1441. Henry Frevert, Gardnerville, Indian.	1490. Tom Conyzony, Mound House, Indian.
1442. Peter Fiorentino, Yerington, Har-Dav.	1491. A. W. Reymers, Yerington, Indian.
1443. J. Fettle, Genoa, Indian.	1492. S. E. Mohatt, Lovelock, Racycle.
1444. Chas. Felesina, Carson, Indian.	1493. Charles H. Drake, Reno, Indian.
1445. John Lucas, Mason, Indian.	1494. John Giardelli, Genoa, Indian.
1446. Otto Olsen, Lovelock, Indian.	1495. J. A. McKenzie, Virginia, Thor.
1447. Louis A. Newman, Sparks, Indian.	1496. Louis W. Trankle, Yerington, Indian.
1448. Tony Pecetti, Reno, Har-Dav.	1497. J. C. Hyatt, Fallon, Har-Dav.
1449. Ronald Harmon, Wadsworth, Excelsior.	1498. Alfred L. Uren, Battle Mtn., Indian.
	1499. C. B. Stroud, Reno, Indian.

LIST OF DEALERS' LICENSES FOR QUARTER ENDING MARCH 31, 1920

Make of vehicle is given last.

D2002...Goldfield Garage Co., Goldfield—Overland.
 D2100...Steinheimer Bros., Reno—Studebaker.
 D2150...Mack Bros., Inc., Reno—Hupmobile, Hudson.
 D2200...Searchlight Garage, Searchlight—Dealer.
 D2250...Dorris Garage, Reno—Cole.
 D2300...Overland Robertson Co., Reno—Overland.
 D2350...I. H. Kent Co., Fallon—Oakland, Maxwell.
 D2400...Albatross Garage, Elko—Overland, Kleiber.
 D2450...James F. Nugent, Yerington—Ford.
 D2500...Revada Sales Co., Reno—Reo.
 D2550...John H. Spencer, Austin—Overland, Willys Knight.
 D2600...Sierra Auto Supply Co., Reno—Buick.
 D2650...Fowles Motor Sales Co., Reno—Ford Speedster.
 D2700...Simcox & Lani, Elko—Ford, Hudson, Franklin.
 D2750...A. W. Hesson Co., Elko—Studebaker.
 D2800...Fallon Garage, Fallon—Oldsmobile, Chevrolet.
 D2850...J. B. Wainwright, Reno—White, Federal, Kleiber.
 D2900...Menardi-Judd Co., Reno—Buick.
 D2950...H. J. Long, Mason—Dealer.
 D3000...Calavada Auto Co., Reno—Ford.
 D3050...Winnemucca Garage, Winnemucca—Ford, Buick, Reo, GMC.
 D3100...E. S. Van Lee, Elko—Dodge.
 D3150...C. O. D. Garage, Minden—Buick, Ford.
 D3200...Battle Mountain Garage, Battle Mountain—Ford.
 D3250...Brown Parker Auto Co., Goldfield—Ford, Buick.
 D3300...Tobar Garage, Clover City—Ford, White, Hudson.
 D3450...H. H. Duke, Elko—Oldsmobile, Oakland, Nash.
 D3550...N. E. Bartoo, Battle Mountain—Buick.
 D3600...Nevada Garage, Fallon—All cars.
 D3650...Lincoln Highway Garage Co., Ely—Ford, Dodge, Reo, Franklin.
 D3700...Palace Garage, Mina—Ford, Mitchell, Kissel.
 D3750...Oden & Dayton, Lovelock—Oldsmobile, Chalmers, Reo, Chevrolet, Hudson, Ford.
 D3850...Offers & Preston, Lovelock—Dodge.
 D3900...Conklin Bros., Las Vegas—Ford.
 D4000...Osen Motor Sales Co., Reno—Dodge.
 D4050...L. A. Gallahorn Co., Reno—Maxwell, Chalmers, Bethlehem trucks.
 D4100...Humboldt Motor Co., Elko—Chevrolet.
 D4150...C. B. Burkham, Hawthorne—Dodge.
 D4200...Brunkyle Garage, Gardnerville—Overland, Oldsmobile.
 D4250...R. D. Jenkins & Co., Reno—Case.
 D4300...Smith Valley Coop. Co., Wellington—Chalmers and second-hand cars.
 D4350...McIntosh Motor Sales Co., Reno—Oldsmobile.
 D4400...Tonopah Auto Supply Co., Tonopah—Ford, Dodge.
 D4450...Nevada Cadillac Co., Reno—Cadillac.
 D4500...Overland Trail Garage, Lovelock—Buick, Oakland, Ford.
 D4550...E. A. Dillard, Yerington—Dealer.
 D4600...C. M. Coddington, Yerington—Reo and trucks.
 D4650...A. W. H. Helberg, Gardnerville—Dodge, Chandler.
 D4700...Midland Garage and Machine Works, Tonopah—Dodge.
 D4750...Martin A. Kiversor, Las Vegas—Second-hand cars.
 D4800...M. R. Penrose, Yerington—Buick.
 D4850...Manuel J. Sullivan, Las Vegas—Dealer.
 D4900...Divide City Garage, Divide City—Dealer.
 D4950...J. S. Clark, Mina—Dealer.
 D5000...Austin Garage, Austin—Ford, second-hand cars.
 D5504...Geo. T. Toombs, Jr., Wells—All cars.
 D5505...Geo. T. Toombs, Jr., Wells—All cars.
 D5508...Arrowhead Garage, Las Vegas—Dealer.
 D5511...D. F. Shovelin, Battle Mountain—Dealer.
 D5512...H. O. Harrison Co., Reno—Essex, Hudson.
 D5541...Plaza Garage, Ely—Overland, Essex, Hudson, Nash, Nelson.
 D5543...Yerington Garage, Yerington—Overland.
 D5545...Wiley Brothers, Reno—Haynes.
 D5549...Erle M. Gray, Carson City—Chevrolet.
 D5555...Lincoln Garage Sales Company of Nevada, Reno—Nash cars and trucks.



STATE OF NEVADA

List of Registered Automobiles
and Motorcycles, to
June 30, 1920

SECOND QUARTERLY REPORT

Compiled by
GEORGE BRODIGAN
Secretary of State of the State of Nevada



CARSON CITY, NEVADA

STATE PRINTING OFFICE : : JOE FARNSWORTH, SUPERINTENDENT
1920

SECOND QUARTERLY REPORT (1920) OF REGISTERED AUTOMOBILES AND MOTORCYCLES

Compiled by **GEORGE BRODIGAN**, Secretary of State

The following pages, compiled in numerical rotation, contain names and addresses of owners who have registered their motor vehicles for the year 1920 with the Secretary of State from April 1, 1920, to June 30, 1920, inclusive, together with the number of the official license-plate issued to each for use as prescribed by law.

This form was adopted at request of some of the officials whose duties include the enforcement of the motor-vehicle laws.

Transfers of licenses and exchanges of cars noted on page 13.

LIST OF REGISTERED AUTOMOBILES FOR QUARTER ENDING DECEMBER 31, 1920

Make of vehicle is given last.

50306.....	Monarch Gold Mines Co, Reno, Cadillac	50385.....	W S Lindsey, Fallon, Chevrolet
50307.....	E O Franklin, Yerington, Ford	50386.....	Nick Gardella, Reno, Ford
50308.....	Mrs S C Taylor, Fallon, Chevrolet	50387.....	Raymond Borda, Gardnerville, Buick
50309.....	W E Sorrell, Fallon, Ford	50388.....	E Johnson, Carson City, Monroe
50310.....	Gregorio Legraspi, Sparks, Chevrolet	50389.....	Mrs K W Hargreaves, Reno, Ford
50311.....	C W Warner, Elko, International	50390.....	L A Nensel, Lovelock, Ford
50312.....	P Rafetto, Reno, Ford	50391.....	A L Bachrad, Lovelock, Reo
50313.....	Reno School Dist 10, Reno, Ford	50392.....	M Dellmonica, Yerington, Ford
50314.....	Jas T McKay, Smith, Buick	50393.....	Thos Gandolfo, Fallon, Hupmobile
50315.....	Frank George, Reno, Ford	50394.....	J W Nichols, Fallon, Ford
50316.....	James Vidovich, Sparks, Chevrolet	50395.....	E B Ketcham, Montello, Ford
50317.....	Edward C Baras, Reno, Hudson	50396.....	Geo Neilson, Reno, Ford
50318.....	Tyler A Moore, Caliente, Buick	50397.....	Wm M Fisher, East Ely, Overland
50319.....	W L Shuler, Elko, Ford	50398.....	H C Lammott, Goodsprings, Maxwell
50320.....	Henry Rabbes, Reno, Cadillac	50399.....	E E Moser, Reno, Dodge
50321.....	United Comstock M Co, Gold Hill, Dodge	50400.....	W Barton Glenn, Reno, Ford
50322.....	H B Larison, Tobar, Ford	50401.....	F J Goeden, Manhattan, Buick
50323.....	C D Woodhouse, Reno, Ford	50402.....	T J Shannon, Winnemucca, Grant
50324.....	David C Lord, Reno, Ford	50403.....	Mrs S L Winnie, Sutro, Ford
50325.....	Lewis H Gibbs, Jr, Lovelock, Chandler	50404.....	James E Page, Sparks, Haynes
50326.....	Dr F M Boyle, Reno, Willys-Knight	50405.....	Harmon and Barnes, Rawhide, Ford
50327.....	Bert Jarvis, Owyhee, Kissel Kar	50406.....	L R Linsea, Fallon, Ford
50328.....	Carl Dietlaf, Schellbourne, Dodge	50407.....	Geo Russell Co, Elko, Dodge
50329.....	J M Swander, Elko, Ford	50408.....	Arnold Odermatt, Reno, Ford
50330.....	J L Newland, Montello, Ford	50409.....	Edward McElhannon, Reno, Ford
50331.....	M R Felts, Gerlach, Federal	50410.....	T W Clark, Reno, Ford
50332.....	M R Felts, Gerlach, Kleiber	50411.....	Geo McDaniel, Wadsworth, Studebaker
50333.....	Curley Rube, Wellington, Ford	50412.....	John L Galli, Mina, Saxon
50334.....	James F Nugent, Yerington, Dodge	50413.....	Dept of Highways, Carson City, Ford
50335.....	Y Kimura, Yerington, Dodge	50414.....	Dept of Highways, Carson City, Nash
50336.....	Henry Guild, Yerington, Dodge	50415.....	Dept of Highways, Carson City, Nash
50337.....	C G Logan, Reno, Overland	50416.....	Dept of Highways, Carson City, Nash
50338.....	O B Cefek, Minden, Reo	50417.....	Dept of Highways, Carson City, Nash
50339.....	R F White, Reno, Ford	50418.....	Dept of Highways, Carson City, Nash
50340.....	Wm Wagner, Reno, Ford	50419.....	Dept of Highways, Carson City, Nash
50341.....	J A Conkey, Wadsworth, Ford	50420.....	Dept of Highways, Carson City, Nash
50342.....	J Ferretto, Brown Station, Chevrolet	50421.....	Dept of Highways, Carson City, Nash
50343.....	Dr Mabel K Young, Eureka, Ford	50422.....	Dept of Highways, Carson City, P-Ar
50344.....	Wm Cosser, Gardnerville, Chevrolet	50423.....	E S Pickard, Reno, Ford
50345.....	Carl G Juchtsier, Minden, Overland	50424.....	Ewing Smoot, Seven Troughs, Ford
50346.....	Standard Oil Co, Reno, Ford	50425.....	Roy C Craig, Goldfield, Hudson
50347.....	Nocah G Dunn, Reno, Ford	50426.....	J H Weatherby, Fallon, Ford
50348.....	Mrs Abram Laird, Eureka, Ford	50427.....	J A Clark, Johnnie, Ford
50349.....	Harry T Hoeker, Sparks, Buick	50428.....	W H Braden, Goldfield, Ford
50350.....	Mrs M H Wallace, Fallon, Chandler	50429.....	E E Hull, Yerington, Haynes
50351.....	Sam Roy, Reno, Maxwell	50430.....	F P Heitman, Carson City, Ford
50352.....	O A Tomlinson, Reno, Maxwell	50431.....	M L Botts, Reno, Dodge
50353.....	Ambro Rosaschi, Yerington, Dorris	50432.....	August Amann, Yerington, Overland
50354.....	George E Handley, Sheepshead, Ford	50433.....	Healy & Ralston, Reno, Ford
50355.....	Edwin P Simmons, Mina, Case	50434.....	C Solari, Reno, Ford
50356.....	Clark & Henry Con Co, Reno, Autocar	50435.....	J P Martin, Reno, Nash
50357.....	Clark & Henry Con Co, Reno, Autocar	50436.....	Geo Cardinella, Reno, Ford
50358.....	Clark & Henry Con Co, Reno, Autocar	50437.....	A B Schwartz, Paradise, Velie
50359.....	Clark & Henry Con Co, Reno, Autocar	50438.....	Charlie Lund, Reno, Chevrolet
50360.....	Western Pacific R Co, Reno, Ford	50439.....	O Monsagrati, Reno, Buick
50361.....	Roy C Craig, Goldfield, Hudson	50440.....	J B Barnes, Reno, Overland
50362.....	Jas Regan, Mound House, Chevrolet	50441.....	Standard Oil Co, Reno, Mack
50363.....	Herbert Pearl, Carson City, Ford	50442.....	Winifred E Bell, Aurora, Buick
50364.....	F G Butler, Reno, Chevrolet	50443.....	Joe Caruso, Reno, Hudson
50365.....	Chas Slaughter, Pioche, Buick	50444.....	Mrs Helen Hoffman, Reno, Buick
50366.....	Sam Sloan, Wabuska, Ford	50445.....	Sam E Davis, Reno, Ford
50367.....	George Peterson, McGill, Oakland	50446.....	Bruce H Chichester, Sweetwater, Ford
50368.....	New Valleys P Co, Lovelock, Reo	50447.....	M Johnson, Lovelock, Ford
50369.....	E R Bendie, Fallon, Chevrolet	50448.....	L C Brunbrook, Reno, Oakland
50370.....	J W Berg, Round Mountain, Cadillac	50449.....	S C Boyde, Tonopah, Dodge
50371.....	A H Howe, Reno, Franklin	50450.....	John Eratzabal, Reno, Dodge
50372.....	H M Middendorf, Montello, Chevrolet	50451.....	Chas Buck & P J Brander, Reno, Ford
50373.....	Frank Meisel, Reno, Buick	50452.....	Geo A Denham, Aurora, Buick
50374.....	E A Siltan, Reno, National	50453.....	John H Dolan, Aurum, Ford
50375.....	W S McDonald, Reno, Ford	50454.....	Ton M Co of Nev, Tonopah, Chandler
50376.....	Chas J Salicchi, Elko, Ford	50455.....	R L Douglass, Fallon, Hudson
50377.....	L Mori, Fallon, Ford	50456.....	W H Parker, Carson City, Chandler
50378.....	Otto Eichenhoff, Reno, Scripp Booth	50457.....	J A Herrmann, Dixie Valley, Ford
50379.....	P S Greeley, Sparks, Ford	50458.....	J A Clark, Johnnie, Ford
50380.....	Lynn Big Six M Co, Carlin, Reo	50459.....	Va & Gold Hill W Co, Va City, Chev
50381.....	August Wehn, Fallon, Ford	50460.....	E J Castillo, Reno, Ford
50382.....	Elmer Ahlborn, Fallon, Ford	50462.....	L D Falconer, Reno, Reo
50383.....	Wm Fitzgerald, Battle Mountain, Ford	50463.....	S S Baines, Reno, Ford
50384.....	V Dondero, Reno, Ford	50464.....	Sterling Auto Shop, Ely, Hupmobile

TRANSFERRED LICENSES

Licenses have been transferred to names set opposite the license
bers as follows:

MOTORCYCLES

1407.....J W Newman, Sparks, Indian	1466.....William Hill, Reno, Indian
1419.....George Evans, Reno, Harley-Davidson	1478.....Robert Butler, Reno, Harley-Davidson
1424.....Lee Lemasters, Reno, Harley-Davidson	1476.....George Cardinalli, Reno, Indian
1459.....C Haydon, Reno, Indian	1480.....H Johannessen, Reno, Harley-Davidson
1460.....Louie Rosasco, Reno, Harley-Davidson	

DEALERS

D3750.....Oden & Palmer, Lovelock—Chalmers, Chevrolet, Chandler, Nash	D5505.....Wellington Garage, Wellington—Ford, Second-hand cars
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AUTOMOBILES

40006.....M E Graves, Reno, Mitchell	42077.....J T Whitnire, Reno, Overland
40027.....Lawton Butler, Tonopah, Chevrolet	42095.....Giocondo Sorani, Sparks, Chandler
40070.....Mrs G Del Wolfensparger, Reno, Chander	42105.....H P Jepsen, Minden, Ford
40073.....W M Gardiner, Reno, Studebaker	42124.....C G Sellman, Reno, Dodge
40074.....Alice McAndrews, Reno, Dodge	42144.....C E Barron, Carson City, Overland
40085.....Firestone Tire & Rubber Co, Reno, Ford	42163.....A J Kingman, Reno, Ford
40110.....Dr F T Brown, Minden, Nash	42205.....Mrs Wm Wagner, Reno, Reo
40149.....C F Atkins, Reno, Buick	42210.....Dan Zuccone, Elko, Chalmers
40152.....E M Wilson, Fallon, Chevrolet	42252.....P A Sample, Reno, Mitchell
40176.....Carl Kuhn, Reno, Hupmobile	42307.....Dale V Clanton, Reno, Ford
40190.....R P Huyck, Reno, Scripps-Booth	42322.....Wm B Layden, Tonopah, Chevrolet
40192.....B P Howell, Reno, Dodge	42356.....Dr Henry Ostroff, Reno, Reo
40208.....T Culverson, Reno, Chevrolet	42406.....E F Fowler, Reno, Studebaker
40249.....Dan Woo, Reno, Chandler	42407.....E F Fowler, Reno, Overland
40275.....John S Keheo, Lovelock, Chevrolet	42491.....M L Soper, Fernley, Maxwell
40298.....A L Borcharding, Tonopah, Overland	42494.....Jacobs Bros, Reno, Maxwell
40346.....Emil Peraldo, Paradise, Dodge	42530.....H A Singleton, Sparks, Buick
40410.....E R Schlink, Reno, Ford	42532.....H P Wolfer, Reno, Ford
40462.....R A Trimble, Dayton, Dodge	42548.....Dr Wm Blank, Minden, Cole
40511.....J P Kennison, Tonopah, Oakland	42549.....John Cobban, Sunnyside, Ford
40542.....Fred Bennett, Silver City, Buick	42648.....Louis Zurfluh, Washoe, Nash
40552.....Frank Smith, Austin, Oakland	42767.....M E Bailey, Tonopah, Hupmobile
40578.....Tom Doherty, Reno, Buick	42840.....Dr H A Fordyce, Reno, Buick
40598.....R A Belcher, Round Mountain, Overland	42869.....The White Co, Reno, Buick
40707.....C E Judd, Reno, Ford	42873.....J C Meyer, Reno, Nash
40789.....Mrs Edna M Furlong, Elko, Oakland	42876.....Geo P Dangberg, Minden, Buick
40917.....P S Fox, Lakeside, Buick	42956.....Earl Tucker, Goodsprings, Maxwell
40962.....Felix Ripa, Fallon, Oldsmobile	43080.....Edward Bickmore, Reno, Studebaker
40988.....C E Towle, Fallon, Hupmobile	43133.....Wayne T Wilson, Reno, Chevrolet
41059.....Louie Svec, Reno, Cadillac	43158.....Charles Tyler, Mason, Ford
41097.....Chas K Barnes, Goodsprings, Buick	43208.....Steve Belli, Carson City, Scripps
41098.....Chas K Barnes, Goodsprings, White	43253.....V D Schafer, Reno, Ford
41123.....E Reinhardt Co, Winnemucca, Internatl	43254.....Frank F Lopes, Lovelock, Ford
41151.....C H Heuer, Reno, Ford	43263.....W H Doyle, Reno, Franklin
41165.....LaVerne R Bronson, Reno, Hupmobile	43268.....El Petrollo Dev Co, Stillwater, Chevrolet
41189.....Sam Wingfield, Fallon, Chevrolet	43287.....Wm R Adams, Geona, Ford
41191.....J B Critchley, Reno, Dodge	43341.....H A Marcotte, Kimberly, Ford
41203.....Carlo Scatena, Yerington, Nash	43392.....Nevada Grocery, Reno, Ford
41213.....Clarence Hellwinkel, Minden, Dodge	43396.....F F Smith, Reno, Ford
41220.....John Ross Yerington, Oakland	43409.....Fred Panelli, Yerington, Chandler
41223.....Maionchi Bros, Yerington, Oldsmobile	43410.....Geo Gardiner, Yerington, Dodge
41258.....Emil Stank, Lovelock, Oldsmobile	43416.....J A Radie, Kimberly, Overland
41296.....J J Smith, Reno, Oldsmobile	43428.....L A Sorenson, Kimberly, Overland
41337.....G W Bonney, Fernley, Scripps-Booth	43436.....David Zeisler, Reno, Dodge
41370.....O F Baldwin, Reno, Studebaker	43518.....Parley Johnson, Kimberly, Buick
41554.....R L McNett, Tonopah, Ford	43554.....L T Herchmer, Eureka, Dodge
41580.....Wm R Adams, Sparks, Essex	43690.....Pearl R Steele, Reno, Chevrolet
41582.....Mrs W G Ducker, Reno, Mitchell	43695.....George A Foster, Reno, Willys-Knight
41591.....R R Ferrel, Reno, Liberty	43755.....W H Jenne, Wadsworth, Ford
41618.....J E Currie, Gardnerville, Maxwell	43756.....Walter G Tallman, Reno, Ford
41678.....J L Woolam, Reno, Dodge	43874.....Wm Hunter, Elko, Nash
41754.....Frank Feldman, Winnemucca, Republic	43876.....H M Gulling, Yerington, Buick
41780.....John Allard, Reno, Buick	43933.....Chas A Eisenmenger, Reno, Studebaker
41785.....O Perry Riker, Wellington, Buick	43953.....Ernest P Raab, Fallon, Chevrolet
41808.....N F Petersen, Reno, Oldsmobile	43996.....Sherman Clay Co, Reno, Dodge
41868.....J D Ferretto, Rawhide, Buick	44129.....Jack B Bockover, Reno, Ford
41877.....R Raymond, Reno, Chandler	44139.....Dan Zuccone, Elko, Ford
41945.....Nick Kesti, Tonopah, Oldsmobile	44196.....Jos Filippic, Reno, Buick
41956.....Wm Scheffeld, Elko, Chandler	44231.....H F Dangberg & L Co, Minden
42022.....Will Beckley, Las Vegas, Stutz	44259.....Fred D Fox, Verdi, Reo
42032.....P M Burns, Reno, Liberty	44289.....S E Davis, Reno, Hupmobile
42048.....Rhodes Salt & Borax Co, Mina, Chev	44290.....F J Byington, Reno, Buick
42068.....Harvey Majors, Reno, Chevrolet	44419.....Daniel P Murphy, Tonopah, Hupmobile

44438....A C Dougherty, Reno, Ford	46878....J T Beckett, Yerington, Buick
44481....Clyde L Brown, Goldfield, Buick	46906....C E Graham, Tonopah, Buick
44495....V D Andrea & A Deni, Reno, Overland	46927....A J Gardisky, Reno, Ford
44515....J F Hillygus, Mason, Oldsmobile	46964....W W Ries, Reno, Ford
44559....E Cammack, Reno, Cadillac	46967....Russel Trather, Reno, Chevrolet
44563....F Z Saymour, Sparks, Chevrolet	47014....Mrs L A Gibbons, Reno, Chandler
44599....J D Cameron, Reno, Buick	47033....Martin Bertelini, Manhattan, Ford
44650....Alex Wise, Virginia City, Chandler	47107....E Mar & A N Oxford, Yerington, Ovind
44662....James Hickey, Gardnerville, Dodge	47123....B F Taber, Reno, Chevrolet
44700....M E McGrath, Reno, Ford	47185....Henry Bassman, Gardnerville, Dodge
44726....Harold P Hale, Elko, Oldsmobile	47212....Omer Buchles, Halleck, Chevrolet
44808....Gerlach Livestock Co, Gerlach, Dodge	47213....F C Osborn & T Gregg, Fallon, Ford
44831....Fred Hughes, Schurz, Ford	47405....Frank Russ, Dayton, Ford
44913....G E Batchelder, Yerington, Buick	47670....Will F Robinson, Reno, Chandler
44973....Dale B Pruett, Carson City, Studebaker	47690....J M Spalding, Reno, Ford
45023....J R Schultz, Carson City, Oldsmobile	47714....B D Billingshurst, Reno, Dodge
45027....M C Hall, Manhattan, Chevrolet	47722....J W Prouty, Sparks, Studebaker
45129....R Robinson, Yerington, Oakland	47806....R Alexander, Goldfield, Ford
45153....Roy Daniels, Austin, Overland	47811....J D Poole, Sparks, Maxwell
45159....Jesse Bryant, Gerlach, Overland	47825....Al Towne, Reno, Overland
45181....James A Yocum, Sparks, Ford	47862....Daniel E Johnson, Sparks, Chevrolet
45224....Newton E Potter, Reno, Ford	47898....A Volkman, Tonopah, Ford
45257....E B Frost, Hawthorne, Buick	47935....J Moore, Reno, Ford
45297....R B Biggar, Reno, Geo	47956....J W McCollum, Reno, Ford
45361....Harold Vaughn, Carson City, Chevrolet	47981....J H Mahnkey, Reno, Crow-Elkhart
45408....R E Rockwell, Elko, Overland	48078....W H Buck, Reno, Buick
45471....Jake Wainwright, Reno, Buick	48134....Elliott E Gill, Reno, Scripps-Booth
45490....Wm Stoner, Reno, Ford	48366....Gillilan & Sons, Paradise Valley, Garfd
45518....C E Mack, Reno, Chandler	48382....C L Deady, Carson City, Grant
45527....Charles Hoy, Reno, Oldsmobile	48401....F T Boysen, Reno, Pierce-Arrow
45545....E J Phillips, Gardnerville, Nash	48458....John Dupratt, Tonopah, Hudson
45662....W Frank Goodner, Reno, Hupmobile	48459....Geo T Nugent, Yerington, Dort
45669....Otto T Williams, Elko, Hupmobile	48487....E E Fernandez, McDermitt, Studebkr
45678....Chris Nielsen, Minden, Willys-Knight	48517....John P Reynolds, Sparks, Ford
45844....J Wood, Reno, Cadillac	48578....Mrs L B McCabe, Carson City, Maxwell
45882....Lincoln Cunningham, Tonopah, Maxwell	48607....A Gianni, Dayton, Ford
46017....Jos H Arthur, Reno, Chevrolet	48640....Union Ice Co, Carson City, Republic
46039....Maybelle Lloyd, Reno, Buick	48674....Drew Bug Quicksilver Mine, Mina, Reno
46044....C H Kramer, Fallon, Oldsmobile	48677....James Bobb, Tonopah, Ford
46049....Roy D Gilbert, Reno, Jeffery	48720....Roth & Crooks, Elko, Overland
46094....E H Mathews, Reno, Maxwell	48915....George Kapich, Reno, Ford
46134....E MaThorpe, Reno, Dodge	49044....F A Laughton, Reno, Chevrolet
46146....E W Kronquist, Schurz, Hupmobile	49087....J E Sullivan, Reno, Hudson
46170....L H Smith, Reno, Ford	49156....Dora Bruce, Elko, Ford
46171....C E Roberts, Reno, Ford	49218....J H Christensen, Reno, Columbia
46173....A L Rainier, Reno, Ford	49222....Lindley & Co, Reno, Dodge
46178....Benedict & Ruddell, Jr, Lovelock, Ford	49333....Mutual Land & Imp Co, Gerlach, Ford
46228....Edward A Ducker, Carson City, Hudson	49405....Wm V Neilsen, Gardnerville, Overland
46584....Stan C Mitchell, Reno, Hudson	49472....Clarence C Stocker, Las Vegas, Ford
46740....R A Rickard, Reno, Ford	49568....J E Thorn, Reno, Studebaker
46748....A D Casey, Wabuska, Dodge	49626....Obrene Koproovich, Tonopah, Chevrolet
46751....M T Doyle, Gerlach, Ford	49646....Mrs M E Spencer, Hawthorne, Ford
46790....P J Ogilvie, Elko, Marmon	49873....T J Boone, Reno, Ford
46808....Wm Donovan, Silver City, Duplex	49956....Ed Hart, Reno, Chevrolet
46852....Chas H Hoy, Reno, Cadillac	



BEFORE THE PUBLIC SERVICE COMMISSION OF NEVADA

IN THE MATTER OF THE APPLICATION OF THE NEVADA-CALIFORNIA POWER COMPANY FOR PERMISSION TO DISCONTINUE ALL POWER AND LIGHTING SERVICE ALONG ITS TRANSMISSION LINE EXTENDING FROM THE NEVADA STATE LINE NEAR THE TOWN OF AURORA TO THE TOWN OF WONDER.

CASE No.
U-204

Hearing November 20, 1919

Appearances:

For the Commission:

Chairman J. F. SHAUGHNESSY,
Commissioner W. H. SIMMONS.

For the Attorney-General of Nevada:

ROBERT RICHARDS, Deputy.

For Mineral County and the Town of Hawthorne:

J. H. WHITE, District Attorney,
B. B. BECKETT, Consulting Engineer.

For the Hawthorne Lighting Company:

CECIL B. BURKHAM.

For Certain Mining Companies:

W. P. ROSS.

For the Nevada Wonder Mining Company:

HUGH H. BROWN, Counsel,
H. C. CARLYLE, General Manager.

For the Nevada-California Power Company:

E. B. CRIDDLE, General Agent,
F. B. MECHLING, Nevada Manager.

OPINION

SHAUGHNESSY, *Chairman*:

The issues in this proceeding arose under an application of the Nevada-California Power Company on November 1, 1919, proceeding under Section 36½ of the Public Service Commission Law, for authority to discontinue power-and-lighting service and to dismantle its transmission line or that portion of its system between Lundy, Calif., and Wonder, Nevada, covering a distance of 122 miles, upon the ground that the line in question was not paying and would not for the future pay the cost of its operation and maintenance.

Upon receipt of the public notice which was given by the Commission, District Attorney J. H. White of Mineral County, on behalf of

said county, the town of Hawthorne, and certain mining interests entered a strong protest and, in cooperation with the Attorney-General of Nevada, began taking steps for the purpose of securing an injunction and the taking of other necessary legal action if arbitrary removal of the lines and service was undertaken by the Power Company in the Rhyolite case some years ago when, without notice, it withdrew its lines from the Rhyolite District to the injury of the public and certain industrial and mining companies.

In addition to the protest and action of District Attorney Wheeler the Nevada Wonder Mining Company filed a protest against the abandonment of service on the ground that it held a ten-year contract with the Power Company, requiring it to continue service upon payment of \$1,400 per month as a minimum to said Power Company until August 10, 1920, and that it desired to pay said minimum and retain the right for the purpose of prospecting its Bell Mountain Mine at Fairview after operations at Wonder had ceased.

Thereafter the matter came on for hearing and was regularly heard before the Commission at Carson City on November 20, 1919.

INTERCORPORATE RELATIONSHIP, OPERATING AND PUBLIC-SERVICE FEATURES

The Nevada-California Power Company is a corporation organized and existing under and by virtue of the laws of the State of Wyoming and is operating throughout Nevada in the counties of Esmeralda, Mineral, and Churchill, under a Nevada franchise acquired by the company under the provisions of an Act of February 27, 1866, as amended March 29, 1907, as amended March 20, 1909, as amended March 26, 1919. The Act of 1909 provides that the franchise shall be held subject to the power of the Public Service Commission to regulate and control services, practices, regulations, and charges of all public utilities operating thereunder. The Act of 1919 relates exclusively to electric utilities, and provides the means by which such utilities operating in two or more counties desiring to extend their business may secure franchises in other counties and extend the remaining period of their original franchise fifty years. Section 36½ of the Public Service Commission Act of 1919, among other things, provides that "it shall be unlawful for any public utility to discontinue, modify or restrict service to any city, town, municipality, community, or territory theretofore served by it, except upon twenty days' notice filed with the Commission, specifying in detail the character and nature of the discontinuance, or restriction of the service intended, and upon order of the Commission, made after hearing, permitting such discontinuance, modification, or restriction of service."

The Power Company generates hydroelectric power at or near Lundy, Mono County, Calif., and on Bishop Creek in Inyo County, Calif. Its market is divided between the power and lighting service which it furnishes to Goldfield, Tonopah, Divide, Silver Peak, Royal Mountain, Millers, Manhattan, Tybo, Aurora, Lucky Boy, Hawthorne, Rawhide, Fairview, and Wonder, and the surplus energy which it sells by leasing portions of its generating plant to the Southern Sierras Power Company, an associate company operating wholly within the State of California.

The Southern Sierras Power Company was constructed largely

the use of the credit of the Nevada-California Power Company and from its surplus earnings made in the southern Nevada market, and it now has a transmission line which carries electric energy from Lundy and Bishop Creek into southern California, terminating at Yuma, Ariz., a distance of over 500 miles. Its present importance is attested by the fact that its net earnings for the year 1918 were \$727,000, while those of the Nevada-California Power Company were \$588,000, or a total of \$1,315,000 for said consolidated hydroelectric system, which is now carried by a holding company known as the Nevada-California Electric Corporation. In the spring of 1917 that portion of the Nevada-California Power Company system between Lundy, Calif., and Wonder, Nevada, here under consideration, was owned and operated as the Pacific Power Corporation, hereinafter termed the Pacific Division, when it was taken over by the said Nevada-California Power Company. The amount of the business and revenues accruing from said Pacific Division has thus far been comparatively small considering the investment, but for the future this condition will be largely offset by leasing the excess portion of the plant to the Southern Sierras Power Company for the generation, transmission, and sale of electrical energy in Southern California.

Traffic Manager Criddle, for the Nevada-California Power Company, put in evidence before the Commission that the cost of acquiring the said Pacific Power Corporation was approximately \$1,500,000, although details covering this transaction are not yet available; further, that the cost of the transmission line from Lundy to Wonder, a distance of 122 miles, originally was \$263,897, while its net salvage value at the present time is \$72,519; that the business has been falling off from year to year; that at the present time there are not sufficient customers to adequately take care of the annual cost of operations, and that, in fact, for the year 1920, he estimates the loss will be \$44,299; that, if the line is to be continued, an expenditure for stubbing and replacement of poles will cost an aggregate of \$24,000, to be spread over the three ensuing annual periods; that the case is one relating solely to the convenience and necessity of maintaining the said Pacific Division and especially the line between Hawthorne and Wonder, where the business is insufficient to justify its operation and maintenance; that not only should the Wonder line be removed but also the rates for service at all points on the company's system should be increased, although such increase is not requested at this time, but may be taken up for later consideration; that the revenues from operation from Hawthorne amount to \$1,200 per year, from Aurora \$200 per year, from the Lucky Boy Mining Company \$3,000 per year, and from the Nevada Wonder Mining Company \$16,800 per year on the basis of a contract minimum payment of \$1,400 per month; that if the line is to be maintained, the following considerations should be taken account of and contracts in accordance therewith executed:

(a) The Nevada Wonder Mining Company is prospecting a promising property at Bell Mountain, near Fairview, and, in order to assist in such investigation, the Power Company has proposed that the Nevada Wonder Mining Company enter into a new contract under which it will at once consent to the removal of the line between Fairview and Wonder, a distance of 22 miles, and continue to pay its

present contract minimum of approximately \$1,400 per month. the end of ninety days thereafter either it will cease all use of tricity on the Bell Mountain property and stop paying the minimum charge and withdraw all objections to the removal of the Wonder line, or it will pay \$3,000 toward the cost of stubbing the line between Hawthorne and Fairview and will continue to pay the same minimum charge on or before the 1st day of May for a period of five years, this option to be exercised by the Nevada Wonder Mining Company until a total of \$15,000 has been paid for the cost of said stubbing at any time on thirty days' notice the mining company to have the privilege of discontinuing the payment of the minimum charge by withdrawing all objections to the removal of the line and the payment to the Power Company of any excess it may have had to pay on account of the stubbing above the sums named. The scheduled rates to apply shall be the Power Company's regular 4-D schedule fixed by the Public Service Commission in Case U-44, subject to the minimum charge and stubbing expense named.

(b) The Lucky Boy Mining Company having signified a desire to operate its mine, and, in order to assist in that development, the Power Company has proposed the payment by that company of a monthly minimum of \$450 until May 1, 1920, when the payment of \$2,000 for stubbing expense shall be made by the mining company and the minimum payment continued. This shall apply for a period of five years, or until a total of \$10,000 shall have been so paid for stubbing by the mining company, as in the other case, to have the privilege of terminating the arrangement and ceasing the minimum payments on thirty days notice by reimbursing the Power Company for any sums it may have spent for stubbing not exceeding \$3,300 per year and withdrawing all objections to the removal of the line.

(c) In consideration of the aforesaid, it is requested that a decision be made by the Commission authorizing the immediate removal of the line from Fairview to Wonder; removal of the line from Hawthorne to Fairview whenever the Wonder company shall cease to pay the minimum charge or cease to make the aforesaid payments for stubbing the poles, unless at that time other business shall be available which shall provide at least as good returns to the Power Company; removal of the line from the Nevada-California state line to Hawthorne at any time upon the failure of the Lucky Boy Company to enter into a contract as offered to them, or to continue payments as therein specified; provided, however, that at such time maintenance of the line shall not be necessitated by service to the Wonder Company or to any other company. Further, that if necessary to entirely withdraw the hydroelectric line as aforesaid, Hawthorne would be taken care of and furnished with lighting and power service by gasoline generation in fulfillment of an existing contract between the Pacific Power Corporation (corporate predecessor of the Nevada-California Power Company) and Mr. Cecil B. Burkham of Hawthorne, Nevada, where the latter has furnished \$4,000 for the building of the Hawthorne distributing system, with the provision that said amount is to be refunded to him on the basis of 40% of the gross revenue until same has been refunded, plus the payment during the interim of 6% interest on the \$4,000 by the Power Company.

POSITION OF THE NEVADA WONDER MINING COMPANY

On behalf of the Nevada Wonder Mining Company, Judge Hugh H. Brown strongly protested against the granting of the application, on the ground that the contract entered into between said company and said Pacific Power Corporation (corporate predecessor of the Nevada-California Power Company) on August 10, 1910, was still in effect, and that so long as it paid to the Power Company a guaranteed minimum revenue of \$1,400 per month, and, while stating that Wonder had reached the end of its productive mining life, and that, while mining operations would soon be completed at said point, he was strongly opposed to the dismantling of the line between Hawthorne and Wonder, on the ground that his company was prospecting certain mining claims within the Fairview District, known as the Bell Mountain property. This property, it was said, shows a well-defined ledge forty feet in width and a mile in length, with values averaging \$4 per ton on the surface. If, after prospecting has been completed, it is found that the ledge matter can be brought up to an average value of \$9 per ton, the property in question will be one of the largest in the State and will justify the immediate construction of a 500-ton-per-day-capacity mill, which would afford a highly attractive and profitable load to the Power Company averaging approximately \$9,000 per month in revenue. Judge Brown further showed that at the time of the hearing the monthly bills were running about \$2,000 per month, while the maximum of \$3,900 was reached at one time, from which it was estimated that the average monthly bills paid by this mining company were approximately \$3,300 per month during the life of its operations.

Following the hearing, and after all mining and industrial operations at Wonder had ceased, the Power Company and the Wonder Mining Company reached an agreement that the transmission line should be withdrawn and held at Fairview unenergized until May 1, 1920, according to advice received from Traffic Manager E. B. Criddle for the Power Company, while advice from H. C. Carlyle, General Manager of the Wonder Company, is to the effect that the Power Company agrees to keep the line at Fairview unenergized as long as the Wonder Company elects to pay the said minimum of \$1,400 per month. As the testimony of record before the Commission, taken after public notice and hearing, clearly indicates that after the clean-up of the Wonder Mining Company's operations there would be no further business available for the Power Company, and as there were no protests from the town of Wonder, the Commission authorized the withdrawal of the line from Wonder to Fairview, a distance of 22 miles, and the same was removed during January, 1920.

POSITION OF HAWTHORNE AND MINERAL COUNTY

District Attorney White made a strong protest on behalf of the Board of County Commissioners and the town of Hawthorne, which may be summarized as follows:

First—That the said Nevada-California Power Company operates said power line as a public convenience and as a public utility and necessity.

Second—That said company and its predecessors, having voluntarily

entered said territory and operated therein without a franchise having failed heretofore to comply with the provisions of the statute of Nevada, should not be permitted to withdraw therefrom at their convenience and in utter disregard of their duties to and the rights of said county and its citizens.

Third—That many citizens of said county, and the county through its officers, have incurred large expenses in the installation of fixtures for light and power, all of which would be a total loss if the petition were granted and said lines taken out.

Fourth—That although for the past two years, owing to war conditions prevailing, affairs in Mineral County have been at a low ebb, yet, with the return to a normal status, there is certain to be a demand for power for mining and other purposes, and to permit such withdrawal at this time would be a severe blow to the prosperity of the entire section.

Fifth—That it is necessary for the public's convenience and for the public's safety that said power lines continue in operation; that if said lines are withdrawn, and a return to coal-oil lamps made necessary, insurance rates on property would rise to a prohibitive level and the danger of losses from fire would be vastly increased.

Sixth—That the said lines through Mineral County are, as the board is informed, but a small part of the large network of lines operated by said Nevada-California Power Company in this and adjacent counties, and which show a large margin of profit upon such operation.

Seventh—That, if the business of the Nevada-California system as a whole were profitable, they could not be heard to complain that they should be allowed to remove the lines of the Pacific Division merely because temporarily they were not paying a profit upon the investment or making sufficient revenues to pay all operating and maintenance expenses. In support of this principle Mr. White cited various authorities for the consideration of the Commission.

Eighth—Wherefore, said District Attorney White strongly urged that the Commission cause to be entered an order denying the application of said Nevada-California Power Company, and commanding said Nevada-California Power Company to continue the operation of said power-and-light lines in Mineral County, without interruption.

Mr. B. B. Beckett, Consulting Electrical Engineer, was placed on the stand by District Attorney White for Hawthorne and Mineral County, and testified regarding the intercorporate and operating relationship between the Nevada-California Power Company and the Southern Sierras Power Company. From his testimony it was made appear that for the year 1918 the cost of producing about half as much power by the Nevada-California Power Company as that generated by the Southern Sierras Power Company was, for generation approximately 2.6 mills per KWH, whereas the cost for the Nevada-California company was but 1.2 mills per KWH, and the intimation was made that by a system of cross entries carried by the two companies an unreasonable proportion of the cost of production is being charged against the Nevada-California Power Company, and that that the Nevada business is more profitable than is shown by the company's annual reports on file with this Commission and referred to as evidence in this case.

The Power Company has thus far failed to satisfactorily meet this testimony, especially as to the aforesaid difference in the cost of generation by the Nevada-California and the Southern Sierras Power Companies. In addition to said generation cost it is to be noted, by reference to the annual reports of the Nevada-California Power Company and to the testimony of Mr. Beckett, that the cost of current purchased by the Nevada-California Power Company from the Southern Sierras Company at 7.5 mills per KWH amounted to \$108,828 for the year 1918, and that the cost for water purchased to produce power was \$103,970, or a total of \$212,978, and, as an offset to this expense, the Nevada-California Company received as lease rental for generating plants the sum of \$200,942.

In Case No. U-44 (Public Service Commission v. Nevada-California Power Company), decided January 29, 1914, it was shown by Consulting Engineer H. P. Gillette's appraisal, after deducting unearned increment, water-right value, and excessive amounts in overhead costs, that the fair original value of the property devoted to the service in southern Nevada was \$3,717,140, while in its depreciated condition as of December 31, 1912, when the appraisal was made, the net value was \$3,318,985. Said original cost value covered not only all transmission and distributing lines and equipment in Nevada but also necessary water, reservoirs, diverting dams, pipe lines, and generating plants Nos. 2, 4, and 5 on Bishop Creek in California.

Recently it has been made to appear to the Commission that Plant No. 4 is the only one on Bishop Creek actually and continuously devoted to the service in said southern Nevada counties, and that Plants 3 and 5 have been leased to the Southern Sierras Company. The rental of \$200,969 paid for these plants by the Sierras Company, compared with the payment of \$108,828 for current purchased from the aforesaid company to supplement Plant No. 4 when needed, would seem to be a good business proposition for the Nevada-California Company. But, if the water originally appraised and charged against the Nevada Company has in large part been leased or transferred to the Sierras Company, for which an operating charge of \$103,970 was made in 1918, we are unable to state definitely (and the record is silent) to what extent there may be a duplication in the aforesaid charges against said Nevada Company for the purchase of water and current. Mr. Beckett's testimony and his challenge to the Power Company that the facts in this behalf be fully disclosed stands unanswered.

From the annual reports of the Nevada-California Power Company there is set forth below a comparative statement of its operations for the years 1911-1918, inclusive, which, it will be noted, shows that there was no water and current purchased by it during the years 1911 and 1912, and that it received no plant rentals for the five-year period of 1911-1915, inclusive. Further, that for the entire period of 1911-1918 the said Nevada company paid out \$278,852 for water and \$660,721 for current purchased, or a total of \$839,573, whereas, beginning in 1916, it has received only \$327,712 in plant rentals, or \$511,861 less than it has paid out for the use of facilities which it owned, controlled, and included in said valuation charged against Nevada, and upon which rates are fixed. It should also be noted that the "cost of power" (which includes power generated and current purchased) has

risen from $4\frac{1}{2}$ tenths of a mill in 1911 to $4\frac{1}{2}$ mills in 1918—an increase of ten times, or 1,000 per cent in the unit cost of production.

TABLE A
Summary of Operations Shown by Annual Reports of Nevada-California Power Company for the Years 1911-1918, inclusive

Year	KWH generated and used	Hydraulic water purchased	Current purchased	Power expenses	Cost of power per KWH (in mills)	Profit per KWH
1911.....	55,000,000	None	None	\$24,926	.45	
1912.....	59,000,000	None	None	35,658	.60	
1913.....	58,000,000	\$2,398	\$95,719	137,256	2.35	
1914.....	79,000,000	4,006	118,458	188,009	2.38	
1915.....	75,000,000	43,080	158,365	249,330	3.33	
1916.....	59,000,000	42,000	81,187	155,151	2.61	\$
1917.....	63,000,000	83,418	98,164	218,164	3.47	
1918.....	56,000,000	103,970	108,828	254,547	4.52	2
Totals	504,000,000	\$278,862	\$660,721	\$1,263,041	-----	\$3
Average for period	63,000,000	\$34,856	\$82,590	\$157,880	2.51	\$

From the testimony of record we are unable to state what plan to incorporate operations has been adopted to accomplish the results shown above. The Commission will further investigate the matter and make such readjustment of valuation, expenses, and earnings as the facts may seem to warrant, but for the purposes of this proceeding it does not seem necessary to pursue the question further at this time.

THE PROFITABLENESS OF THE NEVADA-CALIFORNIA POWER COMPANY'S SYSTEM AS A WHOLE

The question of the profitableness of the Nevada-California Power Company as a whole is raised in this proceeding as well as that of the said Pacific Power Division or branch, and it is strongly urged that, if the system operations as a whole are profitable, the Commission should not authorize the withdrawal of an unprofitable branch or portion of the system without first ascertaining the injurious effect which such action may have upon the public dependent upon hydroelectric power-and-light service. The statistical analysis of the operations of the Pacific Power Corporation and the Nevada California Power Company taken from reports on file with this Commission, covering a period of years set forth in Tables B and C, answers the question of profitableness in comprehensive detail. [Tables B and C appear on pages 9-10.]

It will be noted from Table A that, for the five and one-half years immediately preceding the taking over of the Pacific Power Corporation by the Nevada-California Power Company in 1917, said Pacific Power Division made an average net earning of \$54,089 per annum, or a total of \$297,490 for said period. Further, by reference to Table B, it will be noted that the Nevada-California Power Company's system as a whole, including the Pacific Power Division, for the years 1917-1918, made an average net earning of \$516,591 per annum for an 8½-year period from July 1, 1910, to December 31, 1918, or a total of \$4,391,023 for said period. This is after paying all operating expenses, taxes, and depreciation, and, when applied to the average value of the property (\$4,074,465) for said period, it will be noted that the earning return is 105%, or an average annual net return of 12.68%.

TABLE B
Comparative Statement of the Pacific Power Corporation Showing Gross Earnings, Total Expenses, Net Earnings, and General Average for Years 1912-1916, inclusive

Accounts	Year ending June 30, 1912	Year ending June 30, 1913	Year ending June 30, 1914	Year ending June 30, 1915	Six months, July 1, 1915, to Dec. 31, 1915	Year ending Dec. 31, 1916	Averages	Grand totals
Gross operating earnings.....	\$48,638.25	\$66,823.87	\$82,778.42	\$137,867.31	\$69,197.90	\$138,384.29	\$100,769.10	\$554,230.04
Operating expenses.....	16,418.15	25,989.78	35,081.87	64,502.44	-----	68,837.53	-----	297,829.27
Taxes.....	1,625.68	1,609.65	2,842.63	4,383.18	-----	5,650.26	-----	16,111.40
Total expenses.....	18,043.83	27,599.43	37,924.50	68,885.62	35,131.24	71,639.34	47,131.54	289,223.46
Net operating earnings.....	30,594.42	39,224.44	54,854.42	68,971.69	34,066.66	67,294.96	53,637.56	295,006.58
Nonoperating earnings.....	131.47	250.34	68.76	551.71	406.67	1,074.92	451.62	2,483.91
Net earnings.....	30,725.89	39,474.78	54,923.18	69,523.44	34,473.33	68,369.87	54,089.18	297,490.49

TABLE C

Statement Showing Operating Revenues, Expenses, Capitalization and General Statistical Data of Nevada-California Power Company, for Years 1911-1918, inclusive

(Covers system as a whole, including Pacific Power Corporation for years 1917 and 1918)

Accounts	Year ending June 30, 1911	Year ending June 30, 1912	Year ending June 30, 1913	Year ending June 30, 1914	Year ending June 30, 1915	Six months July 1, 1915, to Jan. 1, 1916	Year ending Dec. 31, 1916	Year ending Dec. 31, 1917	Year ending Dec. 31, 1918	Averages	Grand totals
Gross operating earnings	\$761,642.78	\$736,829.25	\$847,095.98	\$929,928.53	\$925,846.10	\$440,390.56	\$787,876.50	\$787,683.13	\$750,941.43	8845,989.88	\$7,190,914.38
Operating expenses	154,708.66	158,083.43	282,886.43	339,118.30	425,541.94	296,381.52	320,470.85	378,034.72	417,122.75	311,847.64	2,480,705.40
Taxes	21,000.00	21,000.00	18,500.00	18,436.00	30,896.36	15,883.88	41,619.43	57,654.17	67,338.12	32,109.12	2,979,019.16
Depreciation (3.46% factor)	123,800.00	121,990.00	123,990.00	123,990.00	123,990.00	65,883.58	123,990.00	171,931.19	171,233.18	132,117.39	1,151,022.00
Total expenses	306,948.66	301,073.43	425,376.43	481,544.30	579,428.30	294,260.41	486,080.28	538,722.07	653,622.27	479,073.30	3,113,732.34
Operating earnings	454,694.12	435,755.82	421,719.55	448,384.23	396,417.74	145,129.15	301,796.22	249,651.96	477,289.18	365,916.58	3,113,732.34
Nonoperating earnings	2,094.30	62,723.37	68,723.04	88,332.83	53,581.41	31,069.10	242,054.22	304,511.96	443,984.95	149,674.26	1,073,231.81
Net earnings	456,788.42	538,479.19	490,442.59	536,717.06	450,000.00	176,198.25	543,850.44	554,163.92	921,274.13	515,590.84	4,391,123.55
Depreciable property value?	3,585,554.00	3,585,554.00	3,585,554.00	3,585,554.00	3,585,554.00	3,585,554.00	3,585,554.00	3,585,554.00	3,585,554.00	3,585,554.00	3,585,554.00
Original value of property?	3,717,140.00	3,717,140.00	3,717,140.00	3,717,140.00	3,717,140.00	3,717,140.00	3,717,140.00	3,717,140.00	3,717,140.00	3,717,140.00	3,717,140.00
Net return on original value	12.11%	14.46%	16.38%	16.15%	11.96%	6.51%	14.63%	9.56%	10.33%	12.68%	
Total KWH generated	55,081,600	59,188,900	58,315,238	79,073,980	74,799,066	36,015,711	59,377,000	62,892,200	56,389,700	63,648,000	541,008,405
Average cost per KWH (basis of operating expenses only)	2.9 mills	2.3 mills	4.5 mills	4.3 mills	5.7 mills	6.7 mills	5.4 mills	6.0 mills	7.4 mills	5.2 mills	
Average cost per KWH (basis of total expenses)	5.6 mills	4.7 mills	6.9 mills	6.1 mills	7.1 mills	7.9 mills	8.2 mills	9.4 mills	11.6 mills	7.9 mills	
CAPITALIZATION											
Capital stock, common	\$5,000,000.00	\$5,000,000.00	\$5,000,000.00	\$5,000,000.00	\$5,000,000.00	\$5,000,000.00	\$5,000,000.00	\$5,000,000.00	\$5,000,000.00	\$5,000,000.00	\$5,000,000.00
Dividends declared	182,660.00	182,660.00	182,660.00	199,580.00	200,000.00	100,000.00	200,000.00	300,000.00	212,500.00	210,380.00	
FUNDED DEBT											
Bonds authorized—											
1st 6%—1927	3,000,000.00	3,000,000.00	3,000,000.00	3,000,000.00	3,000,000.00	3,000,000.00	3,000,000.00	3,000,000.00	3,000,000.00	3,000,000.00	
1st and refunding 6%—1966											
1st 6%—1960											
Bonds issued											
1st 6%—1927											
1st and refunding 6%—1966											
1st 6%—1960											
Total bonds issued											
Total bonds retired											
Net 6% bonds outstanding											
Bond interest accrued											
Bond interest paid											
Contract sinking fund											
Requirement											
	71,817.90	81,811.75	81,341.32	73,196.16	50,082.53		61,755.36	64,042.04	70,680.81	89,274.71	

Estimated.

Viewed from another standpoint, it may be noted that the net earnings for the years 1907 to 1910, inclusive, shown in Case U-44 (Public Service Commission of Nevada v. Nevada-California Power Company), decided January 29, 1914, amount to \$1,808,136. This latter sum, when added to the aforesaid net earnings of \$4,391,023 for the period of 1911-1918, inclusive, gives an aggregate net earning of \$6,199,159, which this company has made since 1907. Taking said \$4,074,465 shown in Table B as the average investment charged against the Nevada service (and the true average, since the beginning of operations in 1907 is very much less than this amount), it will be noted that the above analysis shows that the company has, during the period 1907 to 1918, from said net income of \$6,199,159 made an aggregate net earning return of 150.22%, or, stated differently, it has paid out its aforesaid investment (\$4,074,465) and has remaining in net earnings \$2,125,090, which for the 12½-year period since June 30, 1906, is a net return of 50.22%, or an average of 4.18% per annum.

Without regard to the aforesaid intercorporate difference of \$511,861 in accounting between the Nevada-California and the Southern Sierras Company, which is probably creditable to the Nevada system, based on the generous valuation and depreciation which we have charged against the Nevada business in Table C, it is interesting to note that said Nevada business has paid out the entire investment charged against it; paid all operating expenses, taxes, and a liberal depreciation for the renewal of the property as fast as it reaches the end of its useful life, while, at the same time, paying a return of 4.18% per annum on said investment, and finally leaving a valuable property free from all incumbrances in the hands of the company for the future, from which it may enjoy without hazard for the future the benefits which will accrue from Southern Nevada's present and everincreasing mineral development.

In the face of a showing of this nature, the Commission must necessarily proceed conservatively in disposing of an application such as the one before us for the abandonment of a branch of an exceedingly profitable public utility, and keep in mind not only the interests of the present consuming public but also the charter-grant rights of the State for the protection and proper development of its mineral resources. Many of these resources are yet in the prospective or primary development period and therefore have not reached the production and milling stage, following which they will become profitable patrons of the Power Company.

The Nevada-California Power Company controls the developed hydroelectric power in the Sierra Nevada Range of mountains along that portion of the western boundary of Nevada which serves the industries and towns of that great mineral zone within Mineral, Nye, and Esmeralda Counties. While certain lines or portions thereof serving particular mining camps, where the available ore reserves have been worked out, may be withdrawn from time to time and put into productive use in other sections of the State, it does not by any means follow that authority should be granted by this Commission for the withdrawal entirely from the State of one of the essential branches of the system, as is proposed by the application here under consideration. If no business is available between Hawthorne and Fairview after the expiration of the Wonder Mining Company's contract, and if after

further application and public notice this appears to be the fact, we see no reason why the line should not be withdrawn to Hawthorne and the poles and wires used in serving other portions of the Nevada California system.

In this behalf it has informally been made to appear to the Commission that the Mina and Simon Districts, including the town of Mina, are desirous of securing power from the Power Company by the construction of a line from said districts to Hawthorne to connect with the company's main transmission line. Efforts to negotiate a contract for furnishing service to these communities have thus far failed, the Power Company contending that Mina and Simon should construct a line to a connection with its system at Millers instead of at Hawthorne. In the event that the Power Company elects not to extend its line and give these districts power-and-lighting service, we see no reason why Mina and Simon may not construct a line to Hawthorne and by a connection with the company's system at or near that point receive the necessary power by the payment of just and reasonable rates.

This is, therefore, a developed new field of rich mineral resources wherein connection with and the rendering of service for the future will apparently afford a highly productive use for said Fairview line if developments are not successful at that point.

The Mina-Simon field may be covered by the execution of necessary reciprocal contracts and arrangements for costs of construction including purchase of poles and wire and other materials now in the Fairview line and the construction of said line from Simon and Mina to Hawthorne for the purchase of electric energy from the Power Company on a wholesale basis.

Before the sale or transfer, however, of said Fairview line, the Wonder Mining Company is entitled to just consideration and cooperation from the Power Company in the development of its Bell Mountain property, so long as the mining company is willing to make the aforementioned minimum payment of \$1,400 per month for holding the line at Fairview, unenergized, pending said mine tests, or at the rate of \$16,800 per annum which for the first year, it will be noted, is in excess of the 3-year cost of \$15,000 estimated by the Power Company as necessary for stubbing the pole line east of Hawthorne in order to keep it in good operating condition. In this behalf it should also be noted that the question of abandonment does not turn on a requirement that in addition to the collection from consumers of just and reasonable rates for service, payment should be made for stubbing of the company's transmission pole line. The estimated life of the company's transmission poles in southern Nevada, as given by its consulting engineer, Mr. H. P. Gillette, is thirteen years. The poles in the Lund Fairview line have been in use about ten years. The testimony of Consulting Engineer B. B. Beckett in this proceeding shows that, when the stubbing has been completed at the end of the 3-year period proposed by the company, said poles will have a renewed life of ten years. This expenditure, therefore, is a replacement cost and should be provided for out of the company's depreciation reserve fund. This example illustrates the reason for the creation of a depreciation reserve which is charged off from gross earnings in annual increments for the renewal or replacement of operating equipment when it has reached the end of its useful life. It also illustrates the vice of attempting to charge

said replacements either to operating expenses or against the consumers in addition to rates paid for service, from which it follows that if this practice were permitted there would be no justification for the charging off of the said annual depreciation, and thus creating an unnecessary and improper reserve fund.

BRANCH LINE CANNOT BE ENTIRELY WITHDRAWN FROM NEVADA

Returning to the consideration of that feature of the Power Company's application wherein authority is requested to withdraw its Lundy-Hawthorne line entirely from the State of Nevada unless certain contracts and guaranties are executed by the Lucky Boy Mining Company, now contemplating a resumption of mining operations, it should be stated that, while the Commission has no objection to the execution of a mutually reasonable and nondiscriminatory contract between the Power Company and the Lucky Boy Mining Company, or, in fact, any other companies, it cannot give its consent to the withdrawal of the line between Hawthorne and Lundy and points intermediate and tributary to Hawthorne and the Nevada-California line, including the delivery of such energy from the Lundy power plant as may be necessary from time to time to adequately take care of Hawthorne and said intermediate or tributary points heretofore served, and for such other further energy as may be required for sale and delivery to other towns and to mining, milling, and industrial enterprises that may hereafter construct a transmission line under standard specifications to a point of connection with the Power Company's line at or near Hawthorne.

In passing upon applications from public utilities for authority to discontinue, modify, or restrict public service, the rule of action to be observed, as we understand the Public Service Commission Act, is as follows: Upon public notice, and after hearing of a public utility's application to discontinue service and withdraw its property from the public use to which it is devoted, if it shall satisfactorily appear that, following a fair trial of operation, there has been and is a failure to meet legitimate operating expenses; that an increase in rates not exceeding the reasonable value of the service to the consumers and communities served will not produce adequate earnings to cover said expenses for the future; and that there is an absence of a reasonable offer from the State, county, municipality, persons, firms, or corporations by which public service may be continued for the future through lease or purchase arrangements, the Commission will hold that there is not a sufficient public demand or necessity to justify further operations and that the utility may withdraw its property from the public service. But, in this behalf, it must be understood that the Commission cannot accept the plea that a public utility may, without consulting the public convenience and necessity which has become established, withdraw a branch of its system merely by establishing the fact that there is some pecuniary loss in the operation of the branch which it is desired to abandon, when the system as a whole is profitable. For example, the Power Company in this proceeding cannot be heard to complain that it should be absolved from the fulfilment of its contract obligation to the State to render service in return for its exceedingly valuable charter grant from the State to exercise the right of eminent domain and to collect tolls and charges under the franchise and certificate of

public convenience Acts of Nevada, which enables the company to enjoy a practical monopoly of the territory served. So long as a public utility continues in the profitable enjoyment of its corporate rights and franchises the law imposes upon it the duty of furnishing adequate facilities to serve the public upon its entire system, and it cannot be excused from performing its full duty, without the consent of the State, merely because by ceasing operations on a part of its system the net return would be increased.

One of the principal duties of a public utility company is that of providing reasonable and adequate facilities for serving the public at just and reasonable rates. This duty arises out of the acceptance and enjoyment of powers, privileges, and property rights granted by the State and endures so long as they are retained. It represents a part of what the company undertakes to do in return for them, and its performance cannot be avoided simply because it will be attended with some pecuniary loss. See *U. P. R. R. v. Hall*, 91 U. S. 344; *New Orleans R. R. Co. v. Mississippi*, 112 U. S. 12; *St. Louis and S. Francisco R. R. v. Gill*, 156 U. S. 649; *Munn v. Illinois*, 94 U. S. 111; *Baltimore Gas Case*, 130 U. S. 410; *Thomas v. Railroad Company*, 111 U. S. 71; *L. S. & M. S. R. R. v. Ohio*, 173 U. S. 285; *Atlantic Coast Line R. R. v. North Carolina Commission*, 206 U. S. 1; *Missouri Pacific Railroad v. Kansas*, 216 U. S. 262; *Oregon Railroad and Navigation Co. v. Fairchild*, 224 U. S. ; *Chesapeake and Ohio R. R. v. Public Service Commission of West Virginia*, 242 U. S. 603; *Minnesota Rate Cases*, 230 U. S. 352; *Puget Sound Traction Case*, 244 U. S. 579.

In the *Gill* case, *supra* (156 U. S. 649), the railroad insisted and was able to prove before the court that a maximum 3-cent-fare law, adopted by the Legislature of Arkansas, was actually less than the cost of transporting a passenger over certain lines of its system. In disposing of this question, the United States Supreme Court said:

It therefore appears that the allegations made and the evidence offered did not cover the company's railroad as an entirety even in the State of Arkansas, but were made in reference to that portion of the road originally belonging to the St. Louis, Arkansas and Texas Railway, and extending from the northern boundary of Arkansas to Fayetteville in said State. In this state of facts * * * it could not claim the right to earn a net profit from every mile, section, or other part into which the road might be divided, nor attack as unjust a regulation which fixed a rate at which some such part would be unremunerative; that it would be practically impossible to ascertain in what proportion the several parts should share with the others in the expense and receipts in which they participated; and, finally, that to the extent that the question of injustice is to be determined by the effects of the Act upon the earnings of the company, the earnings of the entire line must be estimated as against all its legitimate expenses under the operation of the Act within the limits of the State of Arkansas.

To the same effect, see *Puget Sound Traction Case* (Seattle), 244 U. S. 579, wherein the same issues were raised by an order of the

Washington Public Service Commission fixing rates. The court's decision follows the reasoning laid down in the Gill case, *supra*.

See, also, the North Carolina Case, *supra* (206 U. S.), wherein Chief Justice White distinguished between a rate-fixing case and a service case, by requiring the railway company to perform its duty to the public, even though the train service was performed at a loss.

QUESTION OF JURISDICTION AND FRANCHISE

The question of jurisdiction of this Commission to act in the premises is raised by the Power Company, on the ground that it is acting in the capacity of an interstate utility. This challenge is not serious, for the reason that it is and always has been well settled that, in the absence of jurisdiction by the National Government, the State's power to act is just as clear as if the Power Company's property were located wholly within the State of Nevada. In this connection it is to be noted that the Federal Government has thus far not assumed regulatory control or jurisdiction over electric power-and-light companies.

The question is raised by the District Attorney of Mineral County in this proceeding that the Power Company is operating within the counties of Mineral and Churchill without having obtained a franchise, and investigation proves that this is true. But, as before stated, the Power Company is operating under a franchise obtained in Nye and Esmeralda Counties and with authority of law for its extension into other counties served or to be served. In any event, the point is immaterial for the purposes of the case before us. The Power Company is clearly a public utility and, even though its operations may not be covered by a franchise in particular counties, it has a practical monopoly at the present time of the hydroelectric facilities available for the district served in the counties of Mineral and Churchill. The right to regulate a public utility is not dependent upon whether it has a franchise or not. The fact that it is engaged in the public service settles the question and makes it subject to just and reasonable regulation by a commission lawfully created and authorized to act. We find the Nevada-California Power Company regularly engaged in the business of the public service in said Mineral and Churchill Counties, and must therefore hold that it is a public utility and fully under the jurisdiction of the Public Service Commission of this State for the purposes of this proceeding. There are ample authorities to sustain the position taken by the Commission regarding the jurisdictional and franchise questions stated above, but the points raised are so elementary and well settled as adjudicated law that it does not seem necessary to pursue the matter further at this time.

CONCLUSIONS

In view of all the facts and circumstances hereinbefore referred to, the Commission is of the opinion that the application of the Power Company to withdraw its Pacific Division lines entirely from the State of Nevada should be denied and that that portion of its application for authority to withdraw the Hawthorne-Fairview line should provisionally be denied, with the understanding that if the Nevada Wonder Mining Company gives notification that it has no further use

for power service and that there is no other business available in the Wonder and Fairview Districts the company may make application to the Commission for the purpose of selling and transferring the Fairview line into other sections of Nevada where it can be productively used.

An order will be entered in conformity with these views.

ORDER

At a general session of the Public Service Commission of Nevada held at its offices in Carson City, Nevada, on April 17, 1920:

Present: Chairman J. F. Shaughnessy and Commissioner W. Simmons, S. G. Colcord, Acting Secretary.

Pursuant to the foregoing opinion, which is hereby referred to and made a part hereof, it is hereby

ORDERED: That the application of the Nevada-California Power Company to withdraw its Pacific Division transmission lines from the State of Nevada and discontinue the furnishing of hydroelectric power to Nevada from its Lundy plant be, and it is hereby, denied.

IT IS FURTHER ORDERED: That the authority heretofore granted the Commission, after publication and hearing, to withdraw that portion of the company's line between Wonder and Fairview which was taken down during January, 1920, be, and it is hereby, affirmed.

IT IS FURTHER ORDERED: That that portion of said application which seeks authority for the withdrawal of the company's transmission line between Hawthorne and Fairview and the discontinuance of furnishing the necessary hydroelectric power from the said Lundy plant to cover the operations of the Wonder Mining Company during the term of its contract, be, and the same is hereby, denied without prejudice to the filing of a new application for authority to remove said line. The Wonder Mining Company should give notice of a desire to withdraw from the terms of its contract prior to the expiration of said contract, and it appears that there is no substantial amount of other business available in the Fairview and Wonder Mining Districts which would justify the continued maintenance of said line for the future.

IT IS FURTHER ORDERED: That that portion of said application which seeks authority for the Power Company to withdraw its transmission lines from Hawthorne, Nevada, to Lundy, Calif., and intermediate and tributary points to Hawthorne, including the necessary hydroelectric power from the Lundy plant to cover present and future Nevada industrial and town requirements intermediate to the Nevada-California line and Hawthorne and tributary to and at the town of Hawthorne, be, and it is hereby, denied.

BY THE COMMISSION,

[SEAL]

S. G. COLCORD, *Acting Secretary*

Dated April 17, 1920.

Issued in Furtherance of the Act of May 8, 1914



UNIVERSITY OF NEVADA

26

RENO, NEVADA, 1920

TOMATO BLIGHT IN NEVADA

By

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TOMATO BLIGHT IN NEVADA

For the last few years gardeners in this State have suffered more or less loss from a blight of the tomato. This disease often destroys from 50% to 100% of the crop. Last summer this trouble was especially serious around Reno, Nevada.

HISTORY OF THE DISEASE

The first definite information concerning the occurrence of tomato blight in Nevada was received by the University in 1910. Professor Frandsen at that time examined some blighted tomato plants sent in by Mr. Heizer of Northam, Nevada. Mr. Heizer described the blight as follows: "The tomato plants die at any stage of growth. They turn yellow, lose their thrifty appearance, and after several weeks or a month die." He stated that tomato raising in this part of Nevada might have to be abandoned if the trouble should become worse. Undoubtedly the blight existed here before the time of Mr. Heizer's report, and its occurrence in home gardens has since been noted on several occasions. In 1896 the appearance of severe tomato blights in Washington led the Agricultural Experiment Station of that State to undertake an investigation of the trouble. In California a tomato blight called "summer blight" was described in 1906 by Smith¹; for several years it had been known to occur in the San Joaquin Valley. A serious blight of tomatoes called "sleepy sickness" is common in the Eastern and the Southern States, but investigations indicate that it is not the same blight that is found in western America. Tomato blights have been reported from Washington, Oregon, California, New Mexico, Nevada, Idaho, Montana, and Utah. They seem to be generally distributed throughout the West and appear to be serious.

There have been no investigations made upon these "western blights" comprehensive enough to determine just how many blights of tomatoes there are in the Western States. In 1914, Humphrey² published the results of his investigations in Washington and called the disease "yellow blight." He found two species of *Fusaria*, fungous parasites, causing the disease. More recent observations indicate that the fungous parasite, *Rhizoctonia*, causes most of the blights in Washington. Other writers think the disease is "physiological" and is not due to a parasite. It is quite probable that there is more than one blight in Nevada; but the fungous parasite, *Fusarium*, has been found

¹Smith, R. E.: Tomato Diseases in California. Calif. Sta. Bul. 175 (1906).

²Humphrey, H. B.: Studies on the Relation of Certain Species of *Fusarium* to the Tomato Blight of the Pacific Northwest. Wash. Sta. Bul. 115 (1914).

in the roots of diseased plants. However, there may be more than one cause of blight in Nevada, and it has never been proved that the *Fusarium* found in the diseased roots caused the disease; although it is reasonable to conclude that it was the cause, as it was so strikingly evident.

SYMPTOMS OF THE DISEASE

After being set out, the plants usually reach a considerable size before showing signs of blight. The disease usually becomes evident just after blossoming-time when the young fruit sets; although there have been some reports from western Nevada indicating that the disease may appear earlier. The plants stop growing, or grow spindling. The leaves curl at the edges, turn a grayish color, and later turn yellow. The fruit turns yellow and then red without getting any larger. Finally the whole plant collapses and dies. Sometimes the disease appears only in spots in the field, and at other times practically all the plants in a field may die. The roots are partially decayed or destroyed in badly infected plants. In the early stages of the disease this may not be so evident; but a careful examination will show discoloration and decay in the small lateral roots. The decay begins at the tips of the roots and works upward.

CAUSE OF THE DISEASE

The cause of the so-called "western blight," "summer blight" or "yellow blight" of tomatoes is somewhat in doubt. Most of the evidence now at hand indicates that these troubles are due to one or more fungous parasites which live in the soil and attack the roots of the plants. The blight in Washington seems to be due to a species of *Rhizoctonia*, and in other States *Fusaria* seem to be the cause. It is therefore possible that we have more than one kind of blight in Nevada, although our examinations have indicated only a *Fusarium* blight. Any parasite which will destroy the roots will of course soon bring about a wilt or blight and the subsequent death of the plant. Both *Rhizoctonia* and the *Fusaria* are fungi that live in the soil, subsisting for a time on dead organic matter, and later attacking the roots of various plants. This makes the control difficult. *Fusaria* will live on the roots and underground parts of a variety of plants, including potatoes, tomatoes, beans, and cabbage. *Fusaria* cause serious diseases of potatoes in Nevada, but whether there is any relation between our tomato and potato troubles has not been established.

High temperature, bright sunshine, and lack of moisture favor the disease. The reasons are that warmth favors the growth of the parasite; and anything that encourages wilting, such as lack of moisture in the soil and increased evaporation of water from the tops due to high humidity, high temperature, and bright sunlight, weakens the plants.

and makes it susceptible to attack. This is the reason for the severity of the disease in midsummer.

CONTROL

It is impossible at this time to suggest any means of completely controlling the tomato blights. In the first place, there is some uncertainty as to the exact causes of our blights; and, secondly, it is very difficult to control diseases caused by soil fungi. Good cultural practices and plant sanitation should help to control the disease. *Spraying is useless because the parasite attacks the roots only.* The following practices should help to keep the blight in check:

1. *Rotation of Crops.* If tomato blight has been bad in a field, it is better not to grow tomatoes there for several years. Even though the blight has not been observed in a tomato field, it is wise when possible to change the crop. Avoid not only tomatoes for a while but other root crops upon which the parasites might live. Alfalfa and cereals are good crops to grow. Do not expect rotation absolutely to control the disease, as there are cases in which the blight has occurred on tomatoes grown in virgin soils; and it is also well to remember that these soil parasites can live for some time on the dead organic matter of the soil. However, rotation is a good cultural practice and should help to check the disease by causing the parasites to die out.

2. *Clean Seed-Bed.* If the plants are to be transplanted, be sure to use clean soil, free from the disease, for the seed-bed. One cannot be sure of clean soil without sterilization, since our soils seem to be generally infected. There are two methods of soil sterilization that can easily be carried out by the ordinary grower.

(a) Sterilization with hot water: The United States Department of Agriculture, in Bulletin 818 (1920), gives the following method for killing soil parasites, which should be effective for the sterilization of soils in pots or plats: Add boiling water to the soil to the amount of seven gallons per cubic foot of soil. Cover for a time to retain the heat.

(b) Sterilization with formaldehyde: Prepare the flats or beds in the usual way and drench the soil with a formaldehyde solution made up of one pint of formalin to thirty gallons of water. Use one gallon of this solution per square foot of soil. The solution can be put on with a watering-can, should be evenly distributed, and should wet the soil thoroughly to a depth of a foot. After treatment cover with heavy burlap or sacks for a day or two to retain the formaldehyde fumes. Treated soils should be stirred and aired for a week before planting.

3. *Care in Transplanting and in Cultivation.* Great care should be taken not to injure the roots in transplanting or in cultivation. Destruction of the roots will tend to cause wilting, which will lower the vitality of the plant and make it more susceptible to the disease.

Experiments in Washington indicated that there was much less of blight in fields where the plants were grown in place and not transplanted. When plants are transplanted, it is advisable to set them fairly deep. This will cause roots to develop from the stem to the place of those destroyed in transplanting.

4. *Use Plenty of Water.* Give the growing plants plenty of water. Lack of moisture increases the severity of the disease because the fungus in destroying the roots, the organs of absorption, is making it more difficult for the plant to get sufficient water. It is important to keep the plants in a vigorous condition.

5. *Grow Vigorous Plants.* Keep the soil fairly high in fertility. Loose and in good condition, as vigorous plants are less susceptible to the disease.

6. *Soil Aeration.* If it is suspected that the soil is badly infected, early fall plowing with frequent cultivation is suggested. Aeration of the soil by frequent cultivation will lessen the amount of fungi in the soil. Some growers have found this quite successful in the control of the soil diseases.

7. *Destruction of Diseased Plants.* Dig up and burn all diseased plants. While this will not keep the soil from becoming infected, it is a poor practice to allow diseased plant material to remain where it can spread infection.

8. *Resistant Varieties.* The breeding of desirable varieties of tomatoes that are resistant to the disease is the one method that should be used for a real control of these blights. This is about our only hope of complete control; but as yet resistant varieties have not been secured for the "western blights." Tomato varieties resistant to the eastern blight, "sleepy sickness," have been developed; but all of these varieties that have been tried in the West have been found to be susceptible to the western blights. Different experiment stations in the West are now trying to develop varieties resistant to the western blights; and it seems reasonable to expect that such varieties will be secured. If there is more than one blight of the tomato in the West, as it now seems, it probably means that a variety resistant to each particular blight must be developed. However, if the good cultural practices outlined above are followed, the western tomato blights should be checked, even if they cannot be absolutely controlled.



NEVADA TAX COMMISSION

BULLETIN No. 24

Assessment of Railroad and Public Utilities for 1920

CARSON CITY, NEVADA,

June 1, 1920.

To County Assessors:

You are hereby directed to place on the tax rolls of your several counties the valuations of interstate and intercounty railroads and public utilities hereinafter set forth under the following resolution:

WHEREAS, A public hearing beginning on the second Monday in January, 1920, having been held and continued from day to day, and all parties interested having been heard or afforded full opportunity to be heard, either in person or by their agents or attorneys, as provided in section 5, chapter 118, Statutes of Nevada, 1919; and the Nevada Tax Commission having fully considered every element, and fairly weighed all evidence placed before it by which assessment valuations shall be established by the said Commission on the several kinds and classes of property mentioned in section 5 of said Act; therefore, be it

Resolved, That the following valuations within Nevada, including all elements named in section 5 of said Act, are hereby established for the several interstate and intercounty railroad and public utility companies enumerated herein, for assessment and taxation purposes for the State, counties, municipalities, and towns, for the year 1920:

The following valuations within Nevada for the several intracounty railroad and public utility companies, enumerated herein, are supplied the Assessor for his use, having been compiled by the Nevada Tax Commission for 1920 on the same uniform basis as the interstate and intercounty valuations of railroad and public utility companies over the assessment of which the Nevada Tax Commission has original jurisdiction:

INTERSTATE AND INTERCOUNTY RAILROAD ASSESSMENT FOR 1920

ATCHISON, TOPEKA AND SANTA FE RAILWAY

County	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Clark	11.60	12.50	\$67,667	\$60,900

Full cash value per mile main track.....	\$5,833.33
Full cash value per mile all track.....	5,374.65
Assessed 1919 per mile main track.....	5,250.00
Assessed 1919 per mile all track.....	4,837.19

BULLFROG AND GOLDFIELD RAILROAD

County	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Nye.....	73.65	76.55	\$283,025	\$283,025
Esmeralda.....	5.30	8.98	33,641	33,641
Totals.....	78.95	84.53	\$316,666	\$316,666

Full cash value per mile main track.....	\$4,010.97
Full cash value per mile all track.....	3,746.20
Assessed 1919 per mile main track.....	3,609.88
Assessed 1919 per mile all track.....	3,371.58

CENTRAL PACIFIC RAILWAY—MAIN LINE

County	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Churchill.....	40.78	56.96	\$3,180,540	\$2,800,000
Elko.....	141.31	201.07	11,227,375	10,100,000
Eureka.....	34.63	46.00	2,588,554	2,300,000
Humboldt.....	65.12	83.28	4,650,200	4,100,000
Lander.....	28.49	34.02	1,899,613	1,700,000
Lyon.....	12.06	17.27	964,825	800,000
Pershing.....	75.04	106.70	5,957,930	5,300,000
Storey.....	10.32	12.63	706,236	600,000
Washoe.....	35.20	76.69	4,282,227	3,800,000
Totals.....	442.95	634.62	\$35,436,000	\$31,800,000

Full cash value per mile main track.....	\$80,000.00
Full cash value per mile all track.....	55,833.14
Assessed 1919 per mile main track.....	72,000.00
Assessed 1919 per mile all track.....	50,254.33

CENTRAL PACIFIC RAILWAY—TECOMA BRANCH

County	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Elko.....	4.029	4.029	\$60,435	\$60,435

Full cash value per mile main track.....	\$15,000.00
Full cash value per mile all track.....	15,000.00
Assessed 1919 per mile main track.....	13,500.00
Assessed 1919 per mile all track.....	13,500.00

CENTRAL PACIFIC RAILWAY—METROPOLIS BRANCH

County	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Elko.....	7.85	8.82	\$117,750	\$117,750

Full cash value per mile main track.....	\$15,000.00
Full cash value per mile all track.....	13,250.34
Assessed 1919 per mile main track.....	12,500.00
Assessed 1919 per mile all track.....	12,015.00

CENTRAL PACIFIC RAILWAY—FERNLEY-LASSEN BRANCH

County	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Lyon.....	1.20	1.42	\$27,481	\$24,733
Washoe.....	66.06	73.61	1,553,129	1,397,816
Totals	67.26	75.03	\$1,580,610	\$1,422,549

Full cash value per mile main track.....\$23,500.00
 Full cash value per mile all track.....21,066.37
 Assessed 1919 per mile main track.....21,150.00
 Assessed 1919 per mile all track.....18,959.73

CENTRAL PACIFIC RAILWAY—FALLON BRANCH

County	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Churchill.....	15.90	20.63	\$270,300	\$243,270

Full cash value per mile main track.....\$17,000.00
 Full cash value per mile all track.....13,102.30
 Assessed 1919 per mile main track.....15,300.00
 Assessed 1919 per mile all track.....11,792.07

CENTRAL PACIFIC RAILWAY—NEVADA-CALIFORNIA BRANCH (BROAD-GAGE)

County	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Churchill.....	10.62	12.32	\$326,752	\$294,077
Lyon.....	69.04	76.53	2,029,736	1,826,762
Mineral.....	84.22	96.62	2,569,912	2,303,921
Totals	163.88	185.37	\$4,916,400	\$4,424,760

Full cash value per mile main track.....\$30,000.00
 Full cash value per mile all track.....26,522.10
 Assessed 1919 per mile main track.....27,000.00
 Assessed 1919 per mile all track.....23,869.89

CENTRAL PACIFIC RAILWAY—NEVADA-CALIFORNIA BRANCH (NARROW-GAGE)

County	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Mineral.....	42.91	49.84	\$643,650	\$579,285

Full cash value per mile main track.....\$15,000.00
 Full cash value per mile all track.....12,914.35
 Assessed 1919 per mile main track.....13,500.00
 Assessed 1919 per mile all track.....11,622.92

RECAPITULATION—CENTRAL PACIFIC RAILWAY

County	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Churchill—Main line.....	40.78	56.96	\$3,190,540	\$2,862,486
Nev.-Cal. br.—b.-gage.....	10.62	12.32	326,752	294,077
Fallon branch.....	15.90	20.63	270,300	243,270
Churchill—Totals.....	67.30	89.91	\$3,777,592	\$3,399,833
Elko—Main line.....	141.31	201.07	\$11,227,375	\$10,104,637
Tecoma branch.....	4.029	4.029	60,485	54,392
Metropolis branch.....	7.85	8.82	117,750	106,975
Elko—Totals.....	153.189	213.919	\$11,405,560	\$10,265,004
Eureka—Main line.....	34.63	46.00	\$2,568,554	\$2,311,699
Humboldt—Main line.....	65.12	83.28	\$4,650,200	\$4,185,180
Lander—Main line.....	28.49	34.02	\$1,899,613	\$1,709,662
Lyon—Main line.....	12.06	17.27	\$964,325	\$867,893
Nev.-Cal. br.—b.-gage.....	69.04	76.53	2,029,786	1,826,762
Fernley-Lassen branch.....	1.20	2.42	50,981	45,883
Lyon—Totals.....	82.30	96.22	\$3,045,042	\$2,740,538
Mineral—				
Nev.-Cal. br.—b.-gage.....	84.22	96.52	\$2,559,912	\$2,303,921
Nev.-Cal. br.—n.-gage.....	42.91	49.84	643,650	579,255
Mineral—Totals.....	127.13	146.36	\$3,203,562	\$2,883,206
Pershing—Main line.....	75.04	106.70	\$5,967,990	\$5,362,137
Storey—Main line.....	10.32	12.63	\$705,236	\$634,712
Washoe—Main line.....	35.20	76.69	\$4,282,227	\$3,854,004
Fernley-Lassen branch.....	66.06	72.61	1,529,629	1,376,666
Washoe—Totals.....	101.26	149.30	\$5,811,856	\$5,230,670
Grand totals.....	744.779	978.339	\$43,025,145	\$38,722,631

Full cash value per mile main track.....	\$57,769.00
Full cash value per mile all track.....	48,977.74
Assessed 1919 per mile main track.....	51,992.10
Assessed 1919 per mile all track.....	39,579.97

LOS ANGELES AND SALT LAKE RAILROAD—MAIN LINE

County	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Clark.....	107.23	136.20	\$5,460,638	\$4,914,574
Lincoln.....	105.35	128.91	5,168,362	4,651,526
Totals.....	212.58	265.11	\$10,629,000	\$9,566,100

Full cash value per mile main track.....	\$50,000.00
Full cash value per mile all track.....	40,092.79
Assessed 1919 per mile main track.....	45,000.00
Assessed 1919 per mile all track.....	36,083.51

LOS ANGELES AND SALT LAKE RAILROAD—ST. THOMAS BRANCH

County	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Clark.....	21.64	24.22	\$324,600	\$292,140

Full cash value per mile main track.....	\$15,000.00
Full cash value per mile all track.....	13,402.15
Assessed 1919 per mile main track.....	13,500.00
Assessed 1919 per mile all track.....	12,061.94

LOS ANGELES AND SALT LAKE RAILROAD—CALIENTE AND PIOCHE BRANCH

County	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Lincoln	32.72	36.50	\$490,800	\$441,720
Full cash value per mile main track.....\$15,000.00				
Full cash value per mile all track.....13,448.57				
Assessed 1919 per mile main track.....13,500.00				
Assessed 1919 per mile all track.....12,101.92				

RECAPITULATION—LOS ANGELES AND SALT LAKE RAILROAD

County	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Clark—Main line.....	107.23	136.20	\$5,460,638	\$4,914,574
St. Thomas branch.....	21.64	24.22	324,600	292,140
Clark—Totals.....	128.87	160.42	\$5,785,238	\$5,206,714
Lincoln—Main line.....	106.35	128.91	\$5,168,362	\$4,651,526
C. and P. branch.....	32.72	36.50	490,800	441,720
Lincoln—Totals.....	138.07	165.41	\$5,659,162	\$5,093,246
Grand totals	266.94	325.83	\$11,444,400	\$10,299,960
Full cash value per mile main track.....\$42,872.55				
Full cash value per mile all track.....35,123.84				
Assessed 1919 per mile main track.....38,585.80				
Assessed 1919 per mile all track.....31,611.45				

NEVADA NORTHERN RAILWAY—MAIN LINE (Ely to Cobre)

County	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Elko	74.40	78.65	\$1,901,309	\$1,711,178
White Pine	69.286	79.85	1,930,318	1,787,286
Totals	143.686	158.50	\$3,831,627	\$3,448,464
Full cash value per mile main track.....\$26,666.67				
Full cash value per mile all track.....24,174.30				
Assessed 1919 per mile main track.....24,000.00				
Assessed 1919 per mile all track.....21,756.87				

NEVADA NORTHERN RAILWAY—MINES-SMELTER BRANCH

County	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
White Pine	24.20	37.40	\$1,210,000	\$1,089,000
Full cash value per mile main track.....\$50,000.00				
Full cash value per mile all track.....32,352.94				
Assessed 1919 per mile main track.....45,000.00				
Assessed 1919 per mile all track.....29,117.65				

RECAPITULATION—NEVADA NORTHERN RAILWAY

County	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
White Pine—Main line.....	69.286	79.85	\$1,930,318	\$1,737,286
Mines-Smelter branch.....	24.20	37.40	1,210,000	1,069,000
Totals—White Pine.....	93.486	117.25	\$3,140,318	\$2,826,286
Elko—Main line.....	74.40	78.65	\$1,901,909	\$1,711,178
Grand totals.....	167.886	195.90	\$5,041,627	\$4,537,464

Full cash value per mile main track.....\$30,030.06
 Full cash value per mile all track.....25,735.71
 Assessed 1919 per mile main track.....27,027.05
 Assessed 1919 per mile all track.....23,162.14

TONOPAH AND GOLDFIELD RAILROAD

County	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Nye.....	1.117	4.071	\$68,763	\$61,887
Emeralda.....	87.186	101.862	1,720,542	1,548,488
Mineral.....	6.760	7.286	123,067	110,760
Totals.....	95.063	113.219	\$1,912,372	\$1,721,135

Full cash value per mile main track.....\$20,119.01
 Full cash value per mile all track.....16,890.91
 Assessed 1919 per mile main track.....18,197.11
 Assessed 1919 per mile all track.....16,201.82

TONOPAH AND TIDEWATER RAILROAD

County	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Nye.....	29.47	29.96	\$142,300	\$128,070

Full cash value per mile main track.....\$4,828.64
 Full cash value per mile all track.....4,746.50
 Assessed 1919 per mile main track.....4,345.78
 Assessed 1919 per mile all track.....4,271.85

VIRGINIA AND TRUCKEE RAILWAY—MAIN LINE

County	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Lyon.....	6.47	8.41	\$99,652	\$89,687
Ormsby.....	13.29	19.60	232,247	209,022
Storey.....	6.34	9.96	118,019	106,217
Washoe.....	26.65	27.73	323,582	296,724
Totals.....	51.75	65.70	\$773,500	\$701,650

Full cash value per mile main track.....\$15,043.48
 Full cash value per mile all track.....11,849.32
 Assessed 1919 per mile main track.....13,539.13
 Assessed 1919 per mile all track.....10,664.88

VIRGINIA AND TRUCKEE RAILWAY—MINDEN BRANCH

County	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Douglas	10.80	12.71	\$35,130	\$76,617
Ormsby	4.45	5.43	36,370	32,733
Totals	15.25	18.14	\$121,500	\$109,350

Full cash value per mile main track	\$7,967.21
Full cash value per mile all track	6,697.91
Assessed 1919 per mile main track	7,170.49
Assessed 1919 per mile all track	6,028.11

RECAPITULATION—VIRGINIA AND TRUCKEE RAILWAY

County	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Douglas—Minden branch	10.80	12.71	\$35,130	\$76,617
Lyon—Main line	6.47	8.41	\$99,652	\$89,687
Ormsby—Main line	13.29	19.60	\$232,247	\$209,022
Minden branch	4.45	5.43	36,370	32,733
Ormsby—Totals	17.74	25.03	\$268,617	\$241,755
Storey—Main line	6.34	9.96	\$118,019	\$106,217
Washoe—Main line	25.65	27.73	\$328,582	\$295,724
Grand totals	67.00	83.84	\$900,000	\$810,000

Full cash value per mile main track	\$13,432.84
Full cash value per mile all track	10,734.73
Assessed 1919 per mile main track	12,089.55
Assessed 1919 per mile all track	9,661.26

NOTE—The Carson shops are appraised for assessment purposes at \$39,000 net. As these shops are employed largely on custom work, only one-half appraised value is included in collective unit valuation of railroad, the other half being assessed separately in Ormsby County.

WESTERN PACIFIC RAILWAY—MAIN LINE

County	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Elko	166.70	189.42	\$5,424,329	\$4,881,896
Eureka	33.08	36.20	1,086,642	932,978
Humboldt	107.86	121.14	3,469,028	3,122,125
Lander	25.03	26.71	764,881	688,393
Pershing	31.95	34.99	1,001,992	901,793
Washoe	62.61	68.95	1,974,488	1,777,039
Totals	427.23	477.41	\$13,671,360	\$12,304,224

Full cash value per mile main track	\$32,000.00
Full cash value per mile all track	28,636.52
Assessed 1919 per mile main track	28,800.00
Assessed 1919 per mile all track	25,772.87

WESTERN PACIFIC RAILWAY—RENO BRANCH

County	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Washoe	21.97	24.28	\$659,100	\$593,190

Full cash value per mile main track	\$30,000.00
Full cash value per mile all track	27,145.80
Assessed 1919 per mile main track	27,000.00
Assessed 1919 per mile all track	24,431.22

RECAPITULATION—WESTERN PACIFIC RAILWAY

County	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Elko.....	166.70	189.42	\$5,424,329	\$4,881,896
Eureka.....	33.06	36.20	\$1,036,642	\$932,978
Humboldt.....	107.86	121.14	\$3,469,028	\$3,122,125
Lander.....	25.03	26.71	\$764,881	\$688,393
Perahing.....	31.95	34.99	\$1,001,992	\$901,798
Washoe—Main line.....	62.61	68.95	\$1,974,488	\$1,777,039
Reno branch.....	21.97	24.28	659,100	593,190
Totals—Washoe.....	84.58	93.23	\$2,633,588	\$2,370,229
Grand totals.....	449.20	501.69	\$14,330,460	\$12,897,414

Full cash value per mile main track.....	\$31,902.18
Full cash value per mile all track.....	28,564.87
Assessed 1919 per mile main track.....	28,711.96
Assessed 1919 per mile all track.....	25,707.93

**RECAPITULATION OF INTERSTATE AND INTERCOUNTY RAILROAD
ASSESSMENT FOR 1920**

Name of railroad	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Atchison, Topeka and Santa Fe Railway.....	11.60	12.59	\$67,687	\$60,900
Bullfrog and Goldfield Railroad.....	78.95	84.53	316,666	285,000
Central Pacific Railway.....	744.779	978.339	43,025,145	38,722,631
Los Angeles and Salt Lake Railroad.....	266.94	325.83	11,444,400	10,299,960
Nevada Northern Railway.....	167.886	195.90	5,041,627	4,537,464
Tonopah and Goldfield Railroad.....	95.053	113.219	1,912,372	1,721,135
Tonopah and Tidewater Railroad.....	29.47	29.98	142,300	128,070
Virginia and Truckee Railway.....	67.00	83.84	900,000	810,000
Western Pacific Railway.....	449.20	501.69	14,330,460	12,897,414
Totals.....	1,910.878	2,325.918	\$77,180,637	\$69,462,574

INTRACOUNTY RAILROAD ASSESSMENT FOR 1920

EUREKA-NEVADA RAILWAY

County	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Eureka.....	85.60	88.10	\$153,411	\$138,075

Full cash value per mile main track.....	\$1,792.18
Full cash value per mile all track.....	1,741.33
Assessed 1919 per mile main track.....	1,619.03
Assessed 1919 per mile all track.....	1,567.25

NEVADA CENTRAL RAILROAD

County	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Lander	98.00	96.00	\$125,000	\$112,500

Full cash value per mile main track.....	\$1,344.09
Full cash value per mile all track.....	1,315.79
Assessed 1919 per mile main track.....	1,209.68
Assessed 1919 per mile all track.....	1,184.21

NEVADA COPPER BELT RAILROAD

County	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Lyon.....	41.47	44.47	\$250,000	\$225,000

Full cash value per mile main track.....	\$6,028.45
Full cash value per mile all track.....	5,621.77
Assessed 1919 per mile main track.....	5,425.60
Assessed 1919 per mile all track.....	5,059.59

PIOCHE-PACIFIC RAILROAD

County	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Lincoln	15.00	17.50	\$25,000	\$22,500

Full cash value per mile main track.....	\$1,666.67
Full cash value per mile all track.....	1,428.57
Assessed 1919 per mile main track.....	1,500.00
Assessed 1919 per mile all track.....	1,285.71

RECAPITULATION OF INTRACOUNTY RAILROAD ASSESSMENT FOR 1920

Name of railroad	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Eureka-Nevada Railway.....	85.60	88.10	\$153,411.00	\$138,075.00
Nevada Central Railroad.....	98.00	96.00	125,000.00	112,500.00
Nevada Copper Belt Railroad.....	41.47	44.47	250,000.00	225,000.00
Pioche-Pacific Railroad.....	15.00	17.50	25,000.00	22,500.00
Totals.....	235.07	245.07	\$553,411.00	\$498,075.00

RECAPITULATION OF INTERCOUNTY AND INTERSTATE RAILROAD ASSESSMENT FOR 1920 AND INTRACOUNTY RAILROAD ASSES- MENT FOR 1920.

Class	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Intercounty and interstate.....	1,910.878	2,325.918	\$77,180,637	\$69,462,574
Intracounty.....	235.07	245.07	553,411	498,075
Totals.....	2,145.948	2,570.988	\$77,734,048	\$69,960,649

**INTERSTATE AND INTERCOUNTY PUBLIC UTILITIES
ASSESSMENT FOR 1920**

Private Car-Line Companies

Name of company	County	Mileage operated	Assessed 1920	Assessed 1919
American Linseed Company, Woolworth Building, New York City, N. Y.	Churchill	67.80	\$128.00	\$109.00
	Clark	128.87	296.00	
	Elko	319.89	586.00	518.00
	Eureka	67.71	124.00	110.00
	Humboldt	172.98	317.00	280.00
	Lander	53.52	96.00	87.00
	Lincoln	138.07	253.00	
	Lyon	82.30	151.00	138.00
	Mineral	127.13	233.00	206.00
	Pershing	106.99	196.00	178.00
	Storey	10.32	19.00	17.00
	Washoe	185.84	340.00	*300.00
Totals		1,460.92	\$2,676.00	\$1,933.00
American Refrigerator Transit Co., Rail- way Exchange Building, St. Louis, Mo.	Churchill	67.80	\$134.00	\$87.00
	Clark	128.87	257.00	167.00
	Elko	394.29	787.00	512.00
	Esmeralda	92.48	185.00	120.00
	Eureka	67.71	135.00	88.00
	Humboldt	172.98	346.00	225.00
	Lander	53.52	107.00	70.00
	Lincoln	138.07	276.00	179.00
	Lyon	82.30	164.00	107.00
	Mineral	133.88	267.00	174.00
	Nye	74.77	149.00	97.00
	Pershing	106.99	214.00	139.00
	Storey	10.32	21.00	13.00
	Washoe	185.84	371.00	242.00
	White Pine	93.49	187.00	123.00
Totals		1,802.81	\$3,600.00	\$2,343.00
Armour and Company, Union Stock Yards, Chicago, Illinois	Churchill	67.80	\$56.00	\$53.00
	Clark	128.87	107.00	120.00
	Elko	319.89	265.00	297.00
	Esmeralda	87.18	73.00	81.00
	Eureka	67.71	56.00	63.00
	Humboldt	172.98	144.00	161.00
	Lander	53.52	45.00	50.00
	Lincoln	138.07	115.00	129.00
	Lyon	82.30	69.00	77.00
	Mineral	133.88	112.00	125.00
	Nye	1.12	1.00	1.00
	Pershing	106.99	89.00	100.00
	Storey	10.32	9.00	10.00
	Washoe	185.84	155.00	172.00
Totals		1,555.97	\$1,296.00	\$1,449.00
Associated Oil Company, Sharon Building, San Francisco, Cal.	Churchill	67.80	\$341.00	\$255.00
	Clark			488.00
	Douglas	10.80	55.00	41.00
	Elko	394.29	1,995.00	1,492.00
	Esmeralda	87.18	441.00	350.00
	Eureka	67.71	343.00	256.00
	Humboldt	172.98	875.00	655.00
	Lander	53.52	271.00	208.00
	Lincoln			523.00
	Lyon	130.24	659.00	493.00
	Mineral	133.88	677.00	507.00
	Nye	1.12	6.00	23.00
	Ormsby	17.74	90.00	67.00
	Pershing	106.99	541.00	405.00
	Storey	16.66	84.00	63.00
	Washoe	211.49	1,070.00	801.00
	White Pine	93.49	472.00	354.00
Totals		1,565.39	\$7,920.00	\$7,236.00

PRIVATE CAR-LINE COMPANIES—Continued

Name of company	County	Mileage operated	Assessed 1920	Assessed 1919
California Dispatch Line, Exposition Building, Pine and Battery Sta., S. F., Cal.	Churchill	67.30	\$246.00	\$213.00
	Clark	128.87	471.00	408.00
	Elko	319.89	1,169.00	1,014.00
	Eureka	67.71	248.00	215.00
	Humboldt	172.98	632.00	548.00
	Lander	53.52	196.00	170.00
	Lincoln	138.07	506.00	438.00
	Lyon	82.30	301.00	261.00
	Mineral	127.13	465.00	403.00
	Pershing	106.99	391.00	339.00
	Storey	10.32	38.00	33.00
	Washoe	185.84	678.00	588.00
Totals		1,480.92	\$5,340.00	\$4,630.00
Cudahy Packing Company, The, 111 West Monroe Street, Chicago, Illinois	Churchill	67.30	\$99.00	\$58.00
	Clark	128.87	190.00	112.00
	Elko	394.29	581.00	344.00
	Eureka	67.71	100.00	59.00
	Humboldt	172.98	255.00	150.00
	Lander	53.52	79.00	46.00
	Lincoln	138.07	208.00	121.00
	Lyon	82.30	121.00	71.00
	Mineral	127.13	187.00	110.00
	Pershing	106.99	158.00	93.00
	Storey	10.32	15.00	9.00
	Washoe	185.84	274.00	161.00
	White Pine	93.49	138.00	81.00
Totals		1,628.81	\$2,400.00	\$1,415.00
Fruit Growers Express, Union Stock Yards, Chicago, Illinois	Churchill	67.30	\$554.00	\$81.00
	Clark	128.87	1,060.00	155.00
	Douglas			13.00
	Elko	319.89	2,632.00	473.00
	Esmeralda	87.18	717.00	105.00
	Eureka	67.71	557.00	81.00
	Humboldt	172.98	1,423.00	208.00
	Lander	53.52	440.00	64.00
	Lincoln	138.07	1,136.00	166.00
	Lyon	82.30	677.00	156.00
	Mineral	133.88	1,101.00	161.00
	Nye	1.12	9.00	1.00
	Ormsby			22.00
	Pershing	106.99	890.00	128.00
	Storey	10.32	85.00	20.00
	Washoe	185.84	1,529.00	254.00
	White Pine			112.00
Totals		1,555.97	\$12,800.00	\$2,200.00
Insulind Storage and Transport Co., 120 Broadway, New York City, N. Y.	Churchill	67.30	\$130.00	(*)
	Elko	319.89	611.00	
	Eureka	67.71	129.00	
	Humboldt	172.98	330.00	
	Lander	53.52	102.00	
	Lyon	82.30	157.00	
	Mineral	127.13	243.00	
	Pershing	106.99	203.00	
	Storey	10.32	20.00	
	Washoe	185.84	355.00	
Totals		1,193.98	\$2,280.00	
Keith Railway Equipment Co., Peoples Gas Building, Chicago, Illinois	Churchill	67.30	\$92.00	\$112.00
	Clark	128.87	176.00	
	Elko	319.89	436.00	255.00
	Eureka	67.71	92.00	58.00
	Humboldt	172.98	236.00	108.00
	Lander	53.52	73.00	47.00
	Lincoln	138.07	188.00	
	Lyon	82.30	112.00	139.00
	Mineral	127.13	173.00	212.00
	Pershing	106.99	146.00	125.00
	Storey	10.32	14.00	17.00
	Washoe	185.84	254.00	169.00
Totals		1,460.92	\$1,992.00	\$1,242.00

*No assessment for 1919.

PRIVATE CAR-LINE COMPANIES—Continued

Name of company	County	Mileage operated	Assessed 1920	Assessed 1919
Kingan Refrigerator Line, Indianapolis, Indiana				(*)
	Churchill	67.30	\$110.00	
	Elko	319.89	527.00	
	Eureka	67.71	112.00	
	Humboldt	172.98	285.00	
	Lander	53.52	88.00	
	Lyon	82.30	136.00	
	Mineral	127.13	210.00	
	Pershing	106.99	176.00	
	Storey	10.32	17.00	
	Washoe	185.84	307.00	
Totals		1,193.98	\$1,968.00	
Live Poultry Transit Co., The, 1209 Fisher Building, Chicago, Illinois				
	Churchill	67.30	\$78.00	\$75.00
	Clark	128.87	150.00	
	Elko	319.89	373.00	356.00
	Eureka	67.71	79.00	75.00
	Humboldt	172.98	202.00	192.00
	Lander	53.52	62.00	60.00
	Lincoln	138.07	162.00	
	Lyon	82.30	96.00	92.00
	Mineral	127.13	148.00	142.00
	Pershing	106.99	125.00	119.00
	Storey	10.32	12.00	11.00
	Washoe	185.84	217.00	207.00
Totals		1,460.92	\$1,704.00	\$1,329.00
Marsh Refrigerator Service Co., Port Washington Road, Milwaukee, Wisconsin				
	Churchill	67.30	\$53.00	\$35.00
	Clark	128.87	102.00	67.00
	Elko	319.89	254.00	166.00
	Esmeralda	92.48	73.00	
	Eureka	67.71	54.00	35.00
	Humboldt	172.98	137.00	90.00
	Lander	53.52	42.00	28.00
	Lincoln	138.07	110.00	71.00
	Lyon	82.30	65.00	48.00
	Mineral	133.88	106.00	66.00
	Nye	104.24	83.00	
	Pershing	106.99	85.00	55.00
	Storey	10.32	8.00	5.00
	Washoe	185.84	145.00	95.00
Totals		1,664.39	\$1,320.00	\$756.00
North American Car Company, 327 South La Salle Street, Chicago, Illinois				(*)
	Churchill	67.30	\$76.00	
	Clark	128.87	146.00	
	Elko	319.89	363.00	
	Eureka	67.71	77.00	
	Humboldt	172.98	196.00	
	Lander	53.52	61.00	
	Lincoln	138.07	157.00	
	Lyon	82.30	93.00	
	Mineral	127.13	144.00	
	Pershing	106.99	120.00	
	Storey	10.32	12.00	
	Washoe	185.84	211.00	
Totals		1,460.92	\$1,656.00	
Pacific Fruit Express Co., 65 Market Street, San Francisco, California				
	Churchill	67.30	\$13,882.00	\$10,379.00
	Clark	140.47	28,975.00	19,874.00
	Douglas	10.80	2,228.00	1,665.00
	Elko	394.29	81,332.00	60,806.00
	Esmeralda	92.48	19,076.00	14,263.00
	Eureka	67.71	13,967.00	10,442.00
	Humboldt	172.98	35,681.00	26,676.00
	Lander	53.52	11,040.00	8,264.00
	Lincoln	138.07	28,480.00	21,293.00
	Lyon	130.24	26,865.00	13,690.00
	Mineral	133.88	27,616.00	20,646.00
	Nye	104.24	21,502.00	16,075.00
	Ormsby	17.74	3,650.00	2,796.00
	Pershing	106.99	22,089.00	16,501.00
	Storey	16.66	3,437.00	2,569.00
	Washoe	211.49	43,636.00	32,613.00
	White Pine	93.49	19,235.00	14,418.00
Totals		1,962.35	\$402,720.00	\$292,900.00

*No assessment for 1919.

PRIVATE CAR-LINE COMPANIES—Continued

Name of company	County	Mileage operated	Assessed 1920	Assessed 1919
Pett Brothers Manufacturing Company, Kansas City, Kansas.....	Churchill.....	67.30	\$60.00	(*)
	Elko.....	319.89	286.00	-----
	Eureka.....	67.71	61.00	-----
	Humboldt.....	172.98	166.00	-----
	Lander.....	53.52	48.00	-----
	Lyon.....	82.30	74.00	-----
	Mineral.....	127.13	114.00	-----
	Pershing.....	106.99	96.00	-----
	Storey.....	10.32	9.00	-----
	Washoe.....	185.84	166.00	-----
Totals.....		1,198.98	\$1,068.00	-----
Pennsylvania Tank Line, Lock-Drawer 544, Sharon, Pennsylvania.....	Churchill.....	67.30	\$182.00	\$325.00
	Clark.....	128.87	348.00	-----
	Elko.....	319.89	863.00	1,544.00
	Esmeralda.....	-----	-----	421.00
	Eureka.....	67.71	183.00	327.00
	Humboldt.....	172.98	467.00	835.00
	Lander.....	53.52	144.00	258.00
	Lincoln.....	138.07	373.00	-----
	Lyon.....	82.30	222.00	397.00
	Mineral.....	127.13	343.00	646.00
	Nye.....	-----	-----	5.00
	Pershing.....	106.99	289.00	516.00
	Storey.....	10.32	28.00	50.00
	Washoe.....	185.84	501.00	896.00
Totals.....		1,460.92	\$3,943.00	\$6,220.00
Philippine Vegetable Oil Company, 11 Broadway, New York City, New York..	Churchill.....	67.30	\$425.00	(*)
	Elko.....	319.89	2,019.00	-----
	Eureka.....	67.71	427.00	-----
	Humboldt.....	172.98	1,092.00	-----
	Lander.....	53.52	338.00	-----
	Lyon.....	82.30	520.00	-----
	Mineral.....	127.13	802.00	-----
	Pershing.....	106.99	675.00	-----
	Storey.....	10.32	65.00	-----
	Washoe.....	185.84	1,173.00	-----
Totals.....		1,198.98	\$7,536.00	-----
Proctor & Gamble Transportation Co., The, Gwynne Building, Cincinnati, Ohio.....	Churchill.....	67.30	\$1,069.00	\$1,165.00
	Elko.....	319.89	5,083.00	5,539.00
	Eureka.....	67.71	1,066.00	1,172.00
	Humboldt.....	172.98	2,722.00	2,996.00
	Lander.....	53.52	842.00	927.00
	Lyon.....	82.30	1,296.00	1,425.00
	Mineral.....	127.13	2,000.00	2,202.00
	Pershing.....	106.99	1,683.00	1,853.00
	Storey.....	10.32	162.00	179.00
	Washoe.....	185.84	2,324.00	3,218.00
Totals.....		1,198.98	\$18,785.00	\$20,675.00
Shell Company of California, 343 Sansome Street, San Francisco, California.....	Churchill.....	67.30	\$104.00	\$206.00
	Clark.....	128.87	199.00	-----
	Elko.....	319.89	492.00	981.00
	Esmeralda.....	87.18	134.00	267.00
	Eureka.....	67.71	104.00	206.00
	Humboldt.....	172.98	267.00	530.00
	Lander.....	53.52	83.00	165.00
	Lincoln.....	138.07	213.00	-----
	Lyon.....	82.30	127.00	252.00
	Mineral.....	133.88	207.00	410.00
	Nye.....	1.12	2.00	3.00
	Pershing.....	106.99	165.00	323.00
	Storey.....	10.32	16.00	32.00
	Washoe.....	185.84	287.00	570.00
Totals.....		1,556.97	\$2,400.00	\$3,952.00

*No assessment for 1919.

PRIVATE CAR-LINE COMPANIES—Continued

Name of company	County	Mileage operated	Assessed 1920	Assessed 1919
Standard Tank Car Co., Sharon, Penn.	Churchill	67.30	\$32.00	(*)
	Clark	123.87	153.00	-----
	Elko	319.89	332.00	-----
	Eureka	67.71	83.00	-----
	Humboldt	172.98	212.00	-----
	Lander	53.52	66.00	-----
	Lincoln	138.07	169.00	-----
	Lyon	82.30	101.00	-----
	Mineral	127.13	155.00	-----
	Pershing	106.99	130.00	-----
	Storey	10.32	13.00	-----
	Washoe	185.84	227.00	-----
Totals		1,460.92	\$1,788.00	-----
Swift Refrigerator Transportation Com- pany, Union Stock Yards, Chicago, Ill.	Churchill	67.30	\$119.00	\$119.00
	Clark	123.87	223.00	227.00
	Elko	394.29	697.00	695.00
	Eureka	67.71	120.00	119.00
	Humboldt	172.98	306.00	305.00
	Lander	53.52	95.00	95.00
	Lincoln	138.07	245.00	244.00
	Lyon	82.30	145.00	145.00
	Mineral	127.13	225.00	224.00
	Pershing	106.99	189.00	189.00
	Storey	10.32	18.00	18.00
	Washoe	185.84	323.00	323.00
	White Pine	93.49	165.00	165.00
Totals		1,623.81	\$2,880.00	\$2,873.00
Union Oil Company of California, Union Oil Building, Los Angeles, California	Churchill	67.30	\$595.00	\$458.00
	Clark	11.60	108.00	1,234.00
	Douglas	10.80	95.00	-----
	Elko	319.89	2,823.00	2,178.00
	Eureka	67.71	599.00	461.00
	Humboldt	172.98	1,523.00	1,178.00
	Lander	53.52	473.00	365.00
	Lincoln	-----	-----	940.00
	Lyon	88.77	785.00	580.00
	Mineral	127.13	1,124.00	886.00
	Nye	-----	-----	443.00
	Ormsby	17.74	167.00	-----
	Pershing	106.99	946.00	728.00
	Storey	16.66	147.00	70.00
	Washoe	211.49	1,870.00	1,265.00
Totals		1,272.58	\$11,260.00	\$10,746.00
Union Refrigerator Transit Co., 99 Wis- consin Street, Milwaukee, Wis.	Churchill	67.30	\$74.00	\$163.00
	Clark	123.87	142.00	439.00
	Douglas	-----	-----	26.00
	Elko	394.29	436.00	954.00
	Esmeralda	-----	-----	224.00
	Eureka	67.71	75.00	164.00
	Humboldt	172.98	191.00	419.00
	Lander	53.52	59.00	130.00
	Lincoln	138.07	163.00	334.00
	Lyon	82.30	91.00	215.00
	Mineral	127.13	141.00	324.00
	Nye	-----	-----	410.00
	Ormsby	-----	-----	43.00
	Pershing	106.99	118.00	259.00
	Storey	10.32	11.00	40.00
	Washoe	185.84	205.00	512.00
	White Pine	93.49	104.00	225.00
Totals		1,623.81	\$1,800.00	\$4,881.00

*No assessment for 1919.

PRIVATE CAR-LINE COMPANIES—Continued

Name of company	County	Mileage operated	Assessed 1920	Assessed 1919
Union Tank Car Company, 15 Exchange Place, Jersey City, New Jersey	Churchill	67.30	\$654.00	\$1,039.00
	Clark	128.87	1,251.00	2,800.00
	Douglas	10.80	105.00	167.00
	Elko	394.29	3,827.00	6,080.00
	Esmeralda	92.48	898.00	1,428.00
	Eureka	67.71	657.00	1,048.00
	Humboldt	172.98	1,679.00	2,672.00
	Lander	53.52	520.00	327.00
	Lincoln	138.07	1,840.00	2,152.00
	Lyon	130.24	1,283.00	1,370.00
	Mineral	133.88	1,300.00	2,068.00
	Nye	104.24	1,012.00	2,614.00
	Ormsby	17.74	172.00	274.00
	Perahing	106.99	1,089.00	1,652.00
	Storey	16.66	162.00	257.00
	Washoe	211.49	2,063.00	3,266.00
	White Pine	93.49	908.00	1,445.00
Totals		1,940.75	\$18,840.00	\$31,147.00
Western Industries Co., Agnew, Cal.	Churchill	67.30	\$90.00	\$75.00
	Elko	319.89	429.00	358.00
	Eureka	67.71	91.00	75.00
	Humboldt	172.98	232.00	192.00
	Lander	53.52	72.00	60.00
	Lyon	82.30	110.00	92.00
	Mineral	127.13	170.00	141.00
	Perahing	106.99	143.00	119.00
	Storey	10.82	14.00	11.00
	Washoe	185.84	249.00	207.00
Totals		1,193.98	\$1,600.00	\$1,828.00
Totals for private car-line companies			\$521,562.00	\$599,255.00

Sleeping-Car Companies

Name of company	County	Mileage operated	Assessed 1920	Assessed 1919
Pullman Car Lines, 79 East Adams Street, Chicago, Illinois	Churchill	67.30	\$29,930.00	\$21,055.00
	Clark	128.87	57,312.00	56,707.00
	Elko	319.89	142,285.00	100,078.00
	Esmeralda	92.48	41,129.00	28,935.00
	Eureka	67.71	30,113.00	21,188.00
	Humboldt	172.98	76,980.00	54,117.00
	Lander	53.52	23,802.00	16,744.00
	Lincoln	138.07	61,404.00	43,196.00
	Lyon	82.30	36,601.00	41,884.00
	Mineral	133.88	59,541.00	25,747.00
	Nye	104.24	46,359.00	52,960.00
	Perahing	106.99	47,581.00	33,471.00
	Storey	10.82	4,590.00	3,228.00
	Washoe	185.84	82,649.00	58,140.00
Totals		1,664.39	\$740,206.00	\$557,445.00

Electric Companies

Name of company	County	Assessed 1920	Assessed 1919
Nevada-California Power Company	Churchill	\$78,500.00	\$70,850.00
	Esmeralda	2,108,652.00	1,897,787.00
	Mineral	173,500.00	156,150.00
	Nye	1,312,651.00	1,181,886.00
Totals		\$3,673,303.00	\$3,305,973.00
Nevada Power Company	Elko	\$30,000.00	\$27,000.00
Nevada Valleys Power Company	Churchill	\$65,663.00	59,097.00
	Lander	15,350.00	14,265.00
	Pershing	94,796.00	85,316.00
Totals		\$176,309.00	\$158,678.00
Truckee River General Electric Co.	Douglas	\$20,623.00	\$18,470.00
	Lyon	133,394.00	120,065.00
	Mineral	9,412.00	8,471.00
	Ormsby	51,305.00	46,174.00
	Storey	102,611.00	82,360.00
	Washoe	780,555.00	637,500.00
Totals		\$1,047,800.00	\$943,020.00
Totals for electric companies		\$4,927,412.00	\$4,434,671.00

Express Companies

Name of company	County	Mileage operated	Assessed 1920	Assessed 1919
American Railway Express Company, Alfred Sutro, Esq., Attorney, 200 Bush Street, San Francisco, California	Churchill	67.30	\$6,780.00	\$6,067.00
	Clark	117.57	11,757.00	10,581.00
	Douglas	11.20	1,120.00	1,008.00
	Elko	394.40	39,440.00	35,496.00
	Esmeralda	115.28	11,528.00	10,375.00
	Eureka	153.31	15,331.00	13,798.00
	Humboldt	172.98	17,298.00	15,568.00
	Lander	146.52	14,652.00	13,187.00
	Lincoln	135.35	13,535.00	12,181.00
	Lyon	181.24	18,124.00	11,812.00
	Mineral	133.88	13,388.00	12,049.00
	Nye	178.92	17,892.00	16,108.00
	Ormsby	17.34	1,734.00	1,561.00
	Pershing	106.99	10,699.00	9,629.00
	Storey	16.66	1,666.00	1,499.00
	Washoe	210.49	21,049.00	18,944.00
	White Pine	93.49	9,349.00	8,414.00
Totals		2,202.92	\$220,292.00	\$198,262.00

Telephone and Telegraph Companies

Name of company	County	Wire mileage	Assessed 1920	Assessed 1919
Austin-Manhattan Telephone Company	Lander	30.00	\$1,875.00	\$1,688.00
	Nye	50.00	3,125.00	2,812.00
Totals		80.00	\$5,000.00	\$4,500.00
Bell Telephone Company	Churchill	217.48	\$26,533.00	\$22,914.00
	Elko	756.11	92,245.00	83,142.00
	Esmeralda	100.39	12,248.00	
	Eureka	143.40	17,495.00	15,768.00
	Humboldt	522.26	63,715.00	56,663.00
	Lander	165.24	20,159.00	18,170.00
	Lyon	151.07	18,431.00	
	Mineral	181.64	22,160.00	6,259.00
	Nye	0.76	93.00	
	Ormsby	35.70	4,355.00	3,926.00
	Pershing	453.15	55,294.00	49,829.00
	Storey	817.50	83,735.00	33,923.00
	Washoe	3,906.30	476,569.00	420,411.00
Totals		6,961.00	\$848,022.00	\$711,000.00

TELEPHONE AND TELEGRAPH COMPANIES—Continued

Name of company	County	Wire mileage	Assessed 1920	Assessed 1919
Bridgeport Telephone and Telegraph Co.	Lyon	26.00	\$1,354.00	\$1,219.00
	Mineral	14.00	729.00	666.00
Totals		40.00	\$2,083.00	\$1,875.00
Golconda Telephone and Power Company	Elko	50.00	\$4,560.00	\$4,104.00
	Humboldt	786.90	67,205.00	60,485.00
	Lander	102.50	9,348.00	8,413.00
	Perahing	259.00	23,621.00	21,258.00
Totals		1,148.40	\$104,734.00	\$94,260.00
Interstate Telegraph Company	Esmeralda	210.80	\$10,540.00	\$9,486.00
	Nye	115.78	5,789.00	5,210.00
Totals		326.58	\$16,329.00	\$14,696.00
Nevada-California-Oregon Telegraph and Telephone Company	Washoe	34.00	\$2,500.00	\$2,250.00
Nevada Northern Telegraph Company	Elko	74.56	\$6,146.00	\$5,531.00
	White Pine	79.39	6,771.00	6,084.00
Totals		153.95	\$12,917.00	\$11,625.00
Nevada Telephone and Signal Company	Churchill	6	378	340
	Lyon	48	2,104	1,893
Totals		54	2,482	2,233
Nevada Telephone and Telegraph Co.	Esmeralda		\$52,660.00	\$47,385.00
	Nye		52,660.00	47,385.00
Totals			\$105,300.00	\$94,770.00
Postal Telegraph-Cable Company	Churchill	203.90	\$22,429.00	\$20,186.00
	Elko	776.05	85,365.00	76,828.00
	Eureka	173.15	19,046.00	17,141.00
	Humboldt	325.00	35,750.00	32,175.00
	Lander	142.50	15,675.00	14,108.00
	Lyon	60.30	6,633.00	5,969.00
	Perahing	375.00	41,250.00	37,125.00
	Storey	51.60	5,676.00	5,109.00
	Washoe	176.20	19,382.00	17,444.00
Totals		2,283.70	\$251,206.00	\$226,085.00
Utah, Idaho and Nevada Telephone Co.	Churchill	95	\$5,965	\$5,388
	Humboldt	271	16,544	14,890
	Lander	98	6,048	5,443
	Lincoln	105	6,615	5,963
	Nye	130	7,800	7,020
	Perahing	358	20,714	18,643
Totals		1,055	\$63,706	\$57,335
Western Union Telegraph Company	Churchill	476.81	\$52,449.00	\$47,012.00
	Clark	437.88	48,167.00	43,492.00
	Douglas	10.81	1,189.00	1,088.00
	Elko	2,005.99	220,559.00	198,105.00
	Esmeralda	454.48	49,993.00	44,661.00
	Eureka	483.32	53,165.00	47,707.00
	Humboldt	1,140.67	125,474.00	112,813.00
	Lander	382.03	42,023.00	37,786.00
	Lincoln	437.70	48,147.00	43,332.00
	Lyon	514.41	56,585.00	50,845.00
	Mineral	557.62	61,338.00	55,161.00
	Nye	93.84	10,322.00	16,661.00
	Ormsby	47.30	5,203.00	4,675.00
	Perahing	337.61	92,126.00	82,969.00
	Storey	177.76	19,554.00	17,574.00
	Washoe	1,058.71	115,908.00	104,289.00
Totals		9,111.84	\$1,002,302.00	\$908,050.00
Totals for telephone and telegraph coa.			\$2,416,581.00	\$2,128,679.00

Water Companies

Name of company	County	Assessed 1920	Assessed 1919
Virginia and Gold Hill Water Company	Lyon	\$3,000.00	\$2,700.00
	Ormsby	60,000.00	54,000.00
	Storey	90,000.00	81,000.00
	Washoe	47,000.00	42,300.00
Totals		\$200,000.00	\$180,000.00
Esmeralda Water and Milling Company	Esmeralda	\$3,600.00	\$3,240.00
	Mineral	11,950.00	11,610.00
Totals		\$15,550.00	\$14,850.00
Totals for water companies		\$215,550.00	\$194,850.00

RECAPITULATION OF INTERCOUNTY AND INTERSTATE PUBLIC UTILITIES FOR 1920

Class	Assessed 1920	Assessed 1919
Electric companies	\$4,927,412.00	\$4,434,671.00
Express companies	220,292.00	198,282.00
Private car-line companies	521,562.00	399,255.00
Sleeping-car companies	740,206.00	557,445.00
Telephone and telegraph companies	2,416,581.00	2,128,679.00
Water companies	215,550.00	194,850.00
Totals	\$9,041,603.00	\$7,913,162.00

INTRACOUNTY PUBLIC UTILITIES ASSESSMENT FOR 1920

Intracounty Electric and Gas Companies

Name of company	County	Assessed 1920	Assessed 1919
Carson City Coal Gas Company	Ormsby	\$7,143.00	\$6,428.00
Consolidated Power and Telephone Company (Power Department)	Clark	21,997.00	19,797.00
Douglas Milling and Power Company	Douglas	16,961.00	15,265.00
Elko-Lamoille Power Company	Elko	112,857.00	101,572.00
Ely Electric Company	White Pine	2,750.00	2,925.00
Ely Light and Power Company	White Pine	58,000.00	52,200.00
Las Vegas Land and Water Company (Electrical Department)	Clark	1,910.00	1,719.00
Reno Power, Light and Water Company (Electrical Department)	Washoe	699,870.00	629,883.00
Reno Power, Light and Water Company (Gas Depart- ment)	Washoe	127,920.00	115,128.00
Winnemucca Water and Light Company (Electrical Department)	Humboldt	60,000.00	54,000.00
Totals		\$1,109,408.00	\$998,917.00

Electric Railroads

Name of company	County	Assessed 1920	Assessed 1919
Nevada Interurban Railway Company	Washoe	\$16,867.00	\$15,000.00
Reno Traction Company	Washoe	66,866.00	60,000.00
Totals		\$83,733.00	\$75,000.00

Intracounty Telephone and Telegraph Companies

Name of company	County	Assessed 1920	Assessed 1919
Baker Telephone Company	White Pine	\$2,925.00	\$2,633.00
Con. Power and Tel. Co. (Telephone Department)	Clark	7,500.00	6,760.00
Elko Telegraph and Telephone Company	Elko	57,143.00	51,429.30
Hawthorne and Mina Telephone Company	Mineral	1,250.00	1,125.00
Mason Valley Telephone and Telegraph Company	Lyon	9,000.00	8,100.00
Nevada Consolidated Telephone and Telegraph Co.	Ormsby	16,400.00	14,760.00
Nevada Interurban Telephone Company	White Pine	1,900.00	1,710.00
Northern Nevada Telephone Company	Elko	5,000.00	4,500.00
Searchlight and Western Telephone Company	Clark	1,000.00	900.00
United Farmers Telephone Company	Douglas	10,000.00	9,000.00
White Pine Telephone Company	White Pine	30,000.00	27,060.00
Yerington Electric Company	Lyon	5,000.00	4,500.00
Totals		\$147,118.00	\$132,407.00

Intracounty Water Companies

Name of company	County	Assessed 1920	Assessed 1919
Austin Water Company	Lander	\$10,000.00	\$9,000.00
Carson Water Company	Ormsby	88,888.00	80,000.00
Elko Water and Light Company	Elko	100,000.00	90,000.00
Ely Water Company	White Pine	100,000.00	90,000.00
Eureka Water Company	Eureka	17,777.00	16,000.00
Goldfield Consolidated Water Company	Esmeralda	100,000.00	90,000.00
Hawthorne Water Company	Mineral	5,555.00	5,000.00
Indian Springs Water Company	Nye	555.00	500.00
Las Vegas Land and Water Company (Water Dept.)	Clark	20,000.00	18,000.00
Manhattan Water Company	Nye	5,714.00	5,142.00
Mason Water, Light and Power Company	Lyon	7,500.00	6,750.00
Reno Power, Light and Water Company (Water Dept.)	Washoe	624,501.00	562,050.00
Ruby Hill Water Works	Eureka	1,667.00	1,500.00
Tonopah Sewer and Drainage Company	Nye	43,750.00	39,375.00
Virginia Ranch Land and Water Company	Douglas	2,867.00	2,571.00
Water Company of Tonopah	Nye	400,500.00	360,450.00
Winnemucca Water and Light Company (Water Dept.)	Humboldt	80,011.00	72,009.00
Wonder Water Company	Churchill	10,000.00	9,000.00
Totals		\$1,619,275.00	\$1,457,347.00

RECAPITULATION OF INTRACOUNTY PUBLIC UTILITIES ASSESSMENT FOR 1920

Class	Assessed 1920	Assessed 1919
Electric and gas companies	\$1,109,408.00	\$998,917.00
Electric railroads	83,353.00	75,000.00
Telephone and telegraph companies	147,118.00	132,407.00
Water companies	1,619,275.00	1,457,347.00
Totals	\$2,959,134.00	\$2,663,671.00

RECAPITULATION OF INTERSTATE AND INTERCOUNTY PUBLIC UTILITIES ASSESSMENT FOR 1920 AND INTRACOUNTY PUBLIC UTILITIES ASSESSMENT FOR 1920.

Class	Assessed 1920	Assessed 1919
Interstate and intercounty public utilities	\$9,041,608.00	\$7,913,182.00
Intracounty utilities	2,959,134.00	2,663,671.00
Totals	\$12,000,737.00	\$10,576,833.00

GENERAL RECAPITULATION

Class	Assessed 1920	Assessed 1919
Interstate and intercounty railroads	\$77,180,637.00	\$89,462,574.00
Intracounty railroads	553,411.00	498,075.00
Totals	\$77,734,048.00	\$89,960,649.00
Interstate and intercounty utilities	\$9,041,603.00	\$7,913,162.00
Intracounty utilities	2,959,134.00	2,663,671.00
Totals	\$12,000,737.00	\$10,576,833.00
Grand totals	\$89,734,785.00	\$80,537,482.00

NEVADA TAX COMMISSION,

EMMET D. BOYLE, *Chairman.*

Attest: F. N. FLETCHER, *Secretary.*

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STATE PRINTING OFFICE  JOE FARNSWORTH, SUPT.

BULLETIN

OF THE

NEVADA STATE BOARD OF HEALTH

Compiled and Edited by **GUSTAV F. RUEDIGER, M.D., Reno**

No. 2

CARSON CITY, NEVADA

May, 1920

THE CARE OF THE BABY IN SUMMER

Our death-rate of babies under two years of age is still higher than that of any other age-group. In some localities at least one baby out of every five born dies before it reaches the age of two years. This is due in large measure to the fact that most young mothers have received no instruction in the care of the baby and have had no experience in this work. Many of our more progressive communities are taking up this subject and are teaching baby care to the girls in school through the little mothers' leagues. Very excellent work is being done by the infant-welfare nurses in our larger cities, and much good is being done also by means of bulletins, leaflets, and newspaper articles, where the services of an infant-welfare nurse cannot be had.

Feeding the Baby in Summer

The baby's food is a matter of great concern to him at any time, as he does not hesitate to let you know, but summer feeding has its special difficulties. If the baby is breast-fed, the mother's perplexities are greatly diminished, and if he is nursed regularly at three- or four-hour intervals, and is given plenty of drinking water between meals, he should come through with flying colors. A bottle-fed baby is much more likely to suffer in the heat of summer, because of the trouble in keeping milk sweet and free from the germs of illness. Milk should be delivered cold, in sealed bottles, and should be kept cold until prepared for the baby's use. If there is any doubt of its purity, it is safe to scald it for the baby, at least during the periods of excessive heat or when the baby's bowels are loose. Bottle-fed children should have their food reduced in very hot weather and should be fed lightly until the weather moderates. They should also be given plenty of water.

Breast Feeding

Breast feeding is the greatest safeguard for the young baby's life and health, and no other service the mother can render the baby is more important than this.

For the first months of life he should have no other food, save pure cool drinking water which in summer should be given him several times a day. But even a breast-fed baby may suffer, if he is overfed. Most physicians agree that not less than three hours should elapse between nursings, and the baby often thrives better on a four-hour interval.

It is most important to the welfare of the baby that the mother should take great care of her own health. Her food, sleep, exercise and general daily care of her own body are all-important to the baby.

If breast milk does not appear to agree with the baby, the mother may need more food, more liquids in her diet, and some change in her health habits. It may be that the baby is being fed too often or is given too much at a feeding, as it is quite easy to overfeed a nursing baby, especially if the mother has a liberal supply of milk. If, on the other hand, the baby does not get enough breast milk, it may need to be supplemented by a small quantity of diluted cow's milk, given after the feeding. The mother should guard her supply of breast milk with the greatest care, at least during the first six months of the baby's life.

The Summer Baby and His Bottle

If for any reason a young baby is deprived of breast milk, he must be bottle-fed. The only good substitute for mother's milk is cow's milk—and no food can adequately nourish the baby which does not at least contain milk in its composition. To secure a supply of clean milk, to have it delivered clean and cold, to keep it clean and cold until it is prepared for the baby's use and then to adapt it to the age, weight and digestive capacity of the baby, requires a great deal of work and care on the part of the mother. Certified milk should be used whenever possible, or the best grade of pasteurized milk. If such milk cannot be had, the supply used must be scalded. Dry milk powder is the best form of canned milk for infants, but no canned milk should be used when a supply of good fresh milk can be procured. The following are average amounts of milk a baby takes at the given ages:

Age	Amount
1-3 days old.....	$\frac{1}{2}$ ounce
1 week.....	1-2 ounces
1 month.....	2 $\frac{1}{2}$ -3 $\frac{1}{2}$ ounces
3 months.....	4-5 ounces
6 months.....	6 ounces
8 months.....	8 ounces

Summer Foods

Mothers, in their anxiety to please their children, are often unwisely indulgent. This is particularly true with respect to food. Tidbits from the family table and "tastes" of all sorts of things help to destroy the baby's natural appetite for simple foods and to upset his digestion. In summer this particular temptation is especially strong. It is no uncommon sight to see a mother offering her baby tastes of ice-cream soda and other drinks at the drug-store, and children barely able to toddle come out carrying their own ice-cream cones. Good home-made ice-cream, whose ingredients are known to the mother, may be given to a well baby after he is 2 years old, if taken at his dinner; but commercial ice-cream, whose composition and age are unknown, is not a safe food for a young child. While pure fruit juices, prepared at home, are excellent for the child and should form a regular part of his daily diet, sweet syrups used for flavoring soft drinks of all kinds at public fountains are hardly to be recommended for young children. Mothers too often give iced tea or coffee to their children. These drinks, whether cold or not, are absolutely harmful for a child. Plenty of cool water is the best summer drink for the baby.

Feeding the Older Baby

After the baby is a year old, he should be fed four times a day if he is healthy, and should have nothing between meals. This rule is especially important in summer when the heat is severe. Many mothers find relief in the care of fretful babies by feeding them all sorts of things at irregular times. It is a very common thing to see a child under 2 years of age munching a banana, a cookie, or a stick of candy. Babies who are thus fed are doubtless among those who easily develop summer diarrhea, a disease responsible for the deaths of thousands of babies every summer. The mother who has the best interests of her baby at heart will refuse to give him those articles of food which are unsuited to his age, and will insist upon feeding him only the right kind of food at regular intervals.

In the second half of the first year, fruit juice, cereals, dried bread, vegetable soup, and yolk of egg should be gradually introduced into the diet of the baby. During the second year he should have cereal and milk morning and night, and egg, or vegetable soup, with bread and butter and milk, at the midday meal. His other meal should be very simple, consisting chiefly of milk.

Baths and Bathing

The healthy baby of whatever age should have a daily bath, usually in the morning. In summer, when it is necessary to keep him cool, he may also be bathed just before going to bed. Tepid water, from 85°

to 90°F, will usually be best for this purpose, though older sturdy babies may like it cooler. Very little soap is needed. It should never be rubbed directly on the skin. Even in the hot weather the baby should be screened from direct drafts during his bath, as he is very easily chilled, and for the same reason he should be quickly dressed after he is taken out of the water.

After the bath the baby should be gently but carefully dried, patting the flesh gently with a soft towel. A very little fine talc may be used in the folds and creases of the skin, as, for example, in the groin and armpit, but many mothers use far too much, thus clogging the pores of the skin.

In hot weather, when the skin is apt to be somewhat inflamed, a bran bath may be found comforting to the baby. For this, fill a cotton bag loosely with bran, soak the bag and squeeze it frequently until the water becomes milky. Put the baby in this bath for a few minutes and dry without rinsing. No soap should be used.

Summer Clothing for the Baby

The excessive heat which prevails in many parts of the United States between June and September is hard on the baby, and it takes a good deal of thought and care on the mother's part to keep him comfortable, by constant attention to food, clothing, baths, and outdoor life.

To insure the baby's comfort through the blazing days of July and August in the eastern and southern parts of the United States, he should be very lightly clothed, even to the point of having off most of his clothing during the hottest part of the day. The light part-wool band, diaper, and perhaps a thin slip, are quite sufficient if the mother is careful to put on his stockings, shirt, and outside garments as the day cools. It is especially important not to chill the baby, and, if there is a sudden drop in the temperature when a storm comes up or a high wind blows, the baby should be dressed at once in such a way that he will not be too suddenly cooled.

In the North and West, clothing must also be adapted to the temperature. There may be days of fierce heat when the baby should be dressed as just described, but, for the most part, the baby will be comfortable with a light-weight shirt and band, petticoat, and a thin slip or dress, with a woolen sack or coat for cooler hours. A little baby's feet should be kept warm, and thin part-wool stockings which cover the knees will usually be required. For the older baby no shoes and stockings are needed in warm weather in the middle of the day.

The mother's judgment must determine what changes are required in order to keep the baby comfortable.

Sleep

The very young baby spends most of his time asleep and is not much disturbed by extreme heat if properly clothed. Such a baby, if fed at the mother's breast, suffers very little from hot weather. But the baby is often restless and uncomfortable. In order to give the year-old baby the fourteen hours of sleep he needs, every effort must be made to keep the room cool, both by night and by day. An electric fan will help, and a sleeping-porch screened against flies and mosquitoes will afford the baby a comfortable bedroom. A bath just before bedtime will often soothe a restless baby and cool the heated skin so he can go to sleep.

Mothers should be warned against giving the baby any sort of medicine to induce sleep. If the baby does not sleep, there is something the matter which requires her careful attention, but she should never give drugs, save under the immediate directions of a good physician.

If the baby must sleep indoors, he should always sleep in a bed by himself, and, whenever possible, in a room by himself, in order that he need not be disturbed from the moment he is put down until he is taken up in the morning.

[The foregoing paper was prepared by Mrs. MAX WEST, The Children's Bureau, U. S. Department of Labor, Washington, D. C.]

PREVENTION OF TYPHOID FEVER

Typhoid fever is one of the most widespread of all infectious diseases, in spite of the fact that it is one of the most easily preventable. There is no country or nation upon the globe in which this disease is not endemic and at times epidemic. Epidemics of typhoid fever are, however, being gradually reduced in frequency and extent, and this is coming about in direct proportion to the extent of the education of the public regarding the spread and prevention of this disease and the adoption of improved measures of sanitation. Just as soon as the mind of every person becomes thoroughly imbued with the fact that typhoid fever is always the result of the ingestion of another person's bodily excreta with our food and drink, and that the disease is never contracted in any other way, just so soon may we hope to be free from this disease.

The problem of prevention of this disease is by no means as difficult as that of the prevention of epidemic influenza, measles or scarlet fever, because the infectious matter is given off from the body of the typhoid-infected individual almost exclusively with the discharges from the bowels and kidneys. In civilized communities, and especially in those where the teachings of modern sanitation have taken root, these discharges are no longer being scattered about promiscuously where they are likely to come in contact with our neighbors. In epidemic influenza, measles and scarlet fever, on the other hand, the infectious material leaves the body of the patient with the discharges from the mouth and nose, and these are much more likely to reach another person than are those from the bowels and kidneys.

In order to thoroughly understand the problems of prevention of typhoid fever, it is necessary for us to have a clear understanding of the various and devious paths along which the excreta from other persons may get into our food and drink or otherwise find their way into our mouths.

It is a well-known fact that careless nurses and other attendants upon those sick with typhoid fever frequently are infected while waiting on the patient. In such cases the infection is practically always finger-borne, and is the direct result of uncleanness on the part of the nurse. In waiting on a very sick patient, there are countless opportunities for the attendant to soil the hands with the patient's excreta, and, if these soiled hands are then permitted to touch the mouth, or any article of food or drink, spoon, fork, etc., which later enters the attendant's mouth, infection is almost certain to result. Such self-infection can be avoided only by most scrupulous cleanliness. The attendant upon the

patient must avoid putting her fingers into her mouth while on duty, and must not prepare or handle articles of food and drink until after her hands have been thoroughly scrubbed with hot water and soap. If soiling of the hands has been extensive, they should in addition be washed in a good disinfecting solution after having been thoroughly scrubbed with a brush and hot water and soap. It is very easy to give these instructions to the attendant, but exceedingly difficult to carry them out without an omission that will prove disastrous. The nursing of a patient sick with an infectious disease should therefore be entrusted only to a person who has had special training in this very exacting art.

Far more disastrous are the consequences when an untrained or careless attendant upon a typhoid-fever patient is permitted to prepare or handle food and drink for other people, and many epidemics have been traced to such practices. The writer clearly recalls an epidemic which he was called to investigate, in which sixteen persons were stricken as a result of being served by a waitress in a boarding-house who was at the time nursing her small daughter, sick with typhoid fever. Many epidemics have been traced to a milk supply coming from a farm where the housekeeper was nursing a typhoid-fever patient and at the same time assisted in the handling of the milk. In one instance the excreta from the patient were thrown out on the ground in close proximity to a spring which was used for cooling the milk. The water soon became polluted, and, as the milk was cooled in it and the cans were rinsed in it, the milk became contaminated, and many cases of typhoid developed among those who used the latter. In another instance the dishes from the sickroom were washed with the same cloth that was used for washing the milk utensils. The utensils became infected, and these infected the milk which was sold to others and started a widespread epidemic. Many similar experiences might be cited, and it is clear to every sanitarian that milk and other dairy products must not be sold from a home where there is a case of typhoid fever, unless the patient is so isolated that it is impossible for the milk to become infected, and nobody who waits on the patient comes in contact with anything that reaches the milkhouse.

Many outbreaks of typhoid fever have been caused by a person handling milk or food for others while he was in the early stages of the disease or was just convalescing from it.

Several years ago there was an outbreak of typhoid fever in a boarding-house at Madison, Wis., in which practically every boarder in the house was stricken. A careful investigation by the state health authorities disclosed the fact that a table waiter at the boarding-house, who was a student in the university, was taken sick

with typhoid fever very shortly after returning to Madison from his summer vacation and continued to wait on table for a number of days after the onset of his illness. This waiter appears not to have been scrupulously clean about his person, and hence soiled and infected his hands with his own excreta and by means of his soiled hands infected some of the food, dishes, or table silver which he was handling for others. If this waiter had been thoroughly aware of the dangers of the least bit of filthiness in handling food for others, this outbreak would probably not have occurred. It must be emphasized, however, that it is never safe to permit a person who is coming down with an infectious disease to continue at his occupation if his work entails the handling of food for others.

A year ago this spring there occurred an outbreak of typhoid fever in Reno which gave rise to fifteen or sixteen cases. The outbreak was investigated by the city health officer, Dr. W. L. Samuels, and traced to a certain eating-house in the city. The possibility of a carrier in the kitchen or dining-room suggested itself, but it was discovered later that there was an entirely different source of the infection. In March of that year a certain laborer on a ranch near Dayton was suffering from a protracted illness which had not been diagnosed. He was not bed-fast, but, as he was incapacitated for work, he came to Reno and got accommodations at the boarding-house just referred to. Here he ate at the table with other boarders, and, as most of the food was served in family style, there was no lack of opportunity for him to handle and infect dishes and foods that were subsequently passed to others. This man afterwards went to work on a ranch near Reno, and a few weeks later one of the laborers on this ranch was stricken with typhoid fever, which was immediately diagnosed by the attending physician. In looking for the possible source of infection in this case, the other man's history was obtained and a blood examination was made at the State Hygienic Laboratory which showed that he was just convalescing from typhoid fever and was still excreting typhoid germs. Working backwards from these facts, the true source of the infection at the boarding-house in Reno was finally arrived at.

Two years ago the writer investigated a small outbreak of typhoid fever in a small town in Nevada which was traced to an infected milk supply. The milk supply had been perfectly satisfactory until the owner of the dairy employed a certain milker who came to him as a stranger. About fifteen days after this milker had come to work in the dairy, there began to appear cases of typhoid fever among those using the milk. New cases appeared at short intervals for a period of two months, when the local health officer made an investi-

gation and found that all patients had been using milk from that particular dairy. He made a visit to the dairy, and soon elicited the fact that this milker had only recently recovered from a protracted illness with typhoid fever. The writer then made a bacteriological examination of this man's excreta and found that they contained great numbers of typhoid germs.

Typhoid Carriers

This milker was a typhoid bacillus carrier because he had completely recovered from his illness, but continued to harbor the germs in his system and gave them off with his bowel excreta. Such germ carriers are by no means rare, and it is estimated by some authorities that nearly half of our typhoid fever cases are infected by a carrier. Most of these carriers have previously suffered from an attack of the disease, but there are some who give no history of previous illness. These are probably individuals who are highly resistant to this disease, and when such a person ingests typhoid-infected food or drink, he may become a germ carrier instead of being taken sick with typhoid.

The first positively identified typhoid carrier in this country seems to have been the cook of New York City and vicinity, frequently referred to as "Typhoid Mary." During a period of ten years she was known to have worked in eight different families. In seven of these typhoid fever broke out within a few weeks after her arrival in the household. A total of twenty-six cases with one death are known to have been caused by this individual. As far as is known, this cook never suffered from an attack of typhoid fever, but a bacteriologic examination of her feces showed the presence of typhoid bacilli in enormous numbers.

The careful work of the Bureau of Communicable Diseases of the State Board of Health of California has clearly shown that a large percentage of the typhoid outbreaks in that State are caused by the activity of carriers. We find for example that Sawyer, in 1912, detected a carrier on a steamship which was plying out of San Francisco harbor. This carrier was found to have infected twenty-seven persons with whom he had been in contact during a period of four years. Four of these patients had died of the infection.

In 1914 there occurred an epidemic in California in which ninety-three persons were infected at a public dinner where food had been infected by a chronic bacillus carrier. In this instance the carrier had infected a quantity of Spanish spaghetti while preparing it. The spaghetti was afterwards baked in a hot oven until it was browned on the surface, but this baking apparently heated the center of the

mass only sufficiently to incubate the bacilli and did not effect sterilization.

Water Supplies as a Source of Typhoid Fever

Epidemics of typhoid fever due to an infected water supply are too well known to require extensive discussion. It is important to remember, however, that such epidemics are always caused by a very recent pollution of the water with human excrement. Many people seem to think that a well which has not been used for months is likely to contain typhoid germs. This is not at all likely to be the case unless the well is so located that human excrement finds its way into it at frequent intervals, either through an improperly protected top or through seepage from a near-by privy vault, cesspool or broken sewer. A well that is not provided with a water-tight cover and a water-tight casing for some distance below the surface is especially liable to pollution, if the vicinity is frequented by many people. The writer recently made an investigation of a small epidemic in Nevada that was traced to pollution of a public well of this kind. The well was located in a somewhat isolated spot in a vacant block, and there was neither sewer, cesspool nor privy vault within 200 feet of it. A close inspection of the premises revealed, however, that tramps and other idlers in the village were using the immediate surroundings of this well as a sort of public privy. In fact, there was a projecting beam from the side of the dilapidated well-house which made a very convenient place for that purpose, and human excrement was found almost inside the upper part of the well. This filth could not escape being washed into the water in the well when it rained, and the epidemic was caused in precisely that way. Evidently the immediate surrounding of the well has previously been befouled by a germ carrier.

Public water supplies must be most carefully safeguarded against all manner of pollution and must be kept under careful supervision by periodic inspection. The authorities in charge of the well just referred to were not aware of the fact that the enclosure was in a very dilapidated condition and that the immediate surroundings were being polluted with human filth. They admitted frankly that the well had not been inspected for at least six years, and were greatly surprised to find it in such unsanitary condition.

When a public water supply is derived from a river or lake that is being polluted, or is liable to be polluted, it must be purified, either by sand filtration or by disinfection. It is not safe to depend on natural purification, because the efficiency of that depends too much upon climatic conditions, temperature, and velocity of the current. I do not mean to say that the velocity of the current in a river affects directly the rate of self-purification of the water. It has been shown, however,

that a sluggish stream undergoes considerable self-purification through sedimentation, and that this factor is of less importance when the current is swift. Moreover, the swifter the current the farther the water will travel in a given number of hours, and therefore the farther the polluting matter will be carried before sufficient time has elapsed for it to be destroyed by oxidation and other agencies. It has been shown also that disease germs travel farther before they are destroyed in the water under ice during cold weather than they do in that same stream during the warm summer months.

Antityphoid Vaccination

Vaccination against typhoid fever has been practised on a large scale in the U. S. Army for over ten years. Many civilians also have been vaccinated during this period, but it is difficult to estimate what degree of protection is conferred by the process in civil life. Statistics from the Army show clearly that a high degree of protection is obtained when the complete course of three injections of a reliable vaccine is given. In 1908, just before antityphoid vaccination was introduced in the Army, the typhoid death rate was 0.23 per 1000 enlisted men. In 1912, one year after this vaccination had been made compulsory, the death rate from typhoid was only 0.04 per 1000 enlisted men, and in 1913 it was 0.

We cannot conclude, however, that this great reduction in the number of deaths from typhoid in the Army is due entirely to antityphoid vaccination. Some credit must be given to improvements in sanitation because a somewhat similar, although much smaller, reduction is observed in civil life where the typhoid death-rate dropped from 0.28 per 1,000 population in 1908 to 0.18 in 1913, and to 0.09 in 1918.

The protective value of antityphoid vaccination in the Army is shown very clearly, however, when we compare the experience in the Spanish-American War in 1898 with that in the recent World War. In the Spanish-American War, 1 out of every 71 enlisted men died of typhoid fever, whereas in the recent World War there was only 1 death for every 25,641 enlisted men. This great improvement must be due chiefly to antityphoid vaccination, because we know that all safeguards in sanitation were broken down under the stress of military necessity in France, and yet the typhoid death rate among the American Expeditionary Forces in France was lower than that in civil life in the registration area of the United States.

Special attention must be called to the fact that there were approximately 1,529 cases of typhoid fever among the American Expeditionary Forces in France between October, 1917, and September 25, 1919. Presumably all, or nearly all, of these cases were in men who had been

recently vaccinated. It appears therefore that antityphoid vaccination is not an absolute protection against this disease and must not be relied upon to the exclusion of other safeguards. In civil life, too, we have examples of typhoid fever developing in those who have been vaccinated against the disease. Most of these cases are supposed to be due to a "massive infection" which is great enough to break down the resistance that has been conferred by the vaccination. The fact that these cases do occur is no condemnation of the vaccination, but emphasizes the necessity of keeping up all known sanitary measures for the protection of our food and drink against pollution.

GUSTAV F. RUEDIGER.

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SELECTION, CARE AND REMODELING OF CLOTHING

By

MARGARET M. JOHNSON

State Club Leader

Designed Primarily for Boys and Girls Club Work



ELDA ROSENBROCK

State Champion in Sewing, 1919

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SELECTION, CARE AND REMODELING OF CLOTHING

It is a great achievement for a girl of moderate means to be always well dressed and keep within her income. Well dressed means dressed appropriately for the occasion in neat attractive garments so suited to the wearer that they bring out all her good qualities and soften any defects. Clothes should quietly and simply emphasize the charm and personality of the wearer, just as a setting does a jewel, so that people will think "what a beautiful girl," instead of "what a beautiful dress," and will remember her instead of her clothes. Garments are in very bad taste that are so extreme in style, striking in design, or gorgeous in color that they attract attention to themselves to the exclusion of the wearer.

HOW TO BE WELL DRESSED

Being well dressed does not depend so much upon the amount of money spent for clothes as it does upon one's ability to select designs, materials, and colors suited to one's self and to the occasions on which they are to be worn.

In order to be well dressed at a reasonable cost, you must *carefully plan your whole wardrobe* before purchasing any garment or material, so that your outfit as a whole will be complete, appropriate, and harmonious. When you have decided just what you need to buy and how much you can pay for it, *buy carefully and slowly*. It pays to spend time hunting just the dress or the material needed to make your wardrobe complete. Too many people buy, on the spur of the moment, garments or materials which seem cheap or attractive, without considering whether they will harmonize with their other clothes, whether they can afford them, or whether they really need them. After your wardrobe is completed, *constant care is necessary* to keep your clothes in good condition; for no one is well dressed whose clothes are not neat and clean.

SELECTION OF CLOTHING

Planning the Wardrobe

First—Decide how much money you can afford to pay for clothes. This amount should have a reasonable relation to your income and your needs. From one-sixth to one-fourth of the total income is generally considered enough to pay for clothing. If you are dependent upon your parents, find out their yearly income and take one-sixth of it. Discuss with your mother what proportion of this amount you can have. Suppose the family income is \$1,800 a year and there are five members of the family—your father, mother, a younger brother and sister and yourself. The \$300 for clothing might be divided as follows: \$160 for the father and mother, \$60 for yourself, and \$40 for each of the younger children. If you are earning money for yourself, you will need and probably have a larger amount to spend for clothes.

Second—Decide what kinds of clothing you need, keeping in mind the amount you have to spend. In general, every girl needs house dresses, clothes for school or business, and clothes for social affairs. Clothes suitable for business can generally be used for travel and

street wear. *If your income is small*, select garments that are suitable for more than one occasion. A suit may be worn with tailored or semi-tailored waists for school or business and, with more fancy waists, to church, the theater, and informal social affairs. Sometimes a one-piece dress may be worn with plain collar and cuffs to school or to work, and with fancy collar and cuffs or additional trimming to social gatherings. A dress may often be made with two waists or with different combinations, thus furnishing a plain garment for work and a more fancy one for social events. Usually, in addition, a party dress or evening gown is needed for more formal social affairs. If a suit is used for school or business, an extra long coat will be needed to wear with the party dress. If a one-piece dress and a long coat are used for school, the same coat may be worn with the party dress. A separate light-colored lining is good to keep the dark coat from soiling the dress. One hat may be made to serve for all occasions. One or two pairs of comfortable sensible shoes will do for school or business. Pumps may be used for evening wear.

If your income allows and your needs demand it, you may have one or two one-piece dresses and a long coat, or a suit and also a one-piece dress and a long coat for school, and several more fancy dresses for afternoon and social affairs. It is better, however, to buy a few clothes at a time and get them of the very best quality and style, so that they will last a long time and always be in good taste. One does not tire easily of a garment that she likes, that fits well, and that is of good style. It is extravagance for a girl of limited means to have several dresses for the same occasion, differing only in color, material, and style.

Third—Decide the color or colors of your outfit. Fewer clothes are needed if each garment looks well and can be worn with the others. Therefore one color should predominate in your outfit. Select a dark or grayed color that is becoming and appropriate. Plan all your garments of this color, different tones of it, or of becoming colors that blend well with it. Consider the color of any clothes on hand that may be remodeled, and, if this color is becoming, use it as the principal color.

Choose colors appropriate for the purpose for which they are to be used. The color of house dresses should be fast for laundering and moderately light. The color of school or business dresses should be moderately dark. Party dresses are usually light in color. Before deciding on colors, read pages 16, 17 on "Color in Dress."

Fourth—Decide the style or general lines of your different garments. Have a higher ideal than mere fashion. Make your clothes simple, individual, and artistic. Avoid extremes. Consider the following: The style of any garment should always be comfortable and healthful. It should be suited to the person wearing it and to the occasion for which it is worn. It should be considered in connection with the material of which the garment is to be made, because a design suitable for light-weight material would never do for a heavy material, like serge. The style of garments worn at the same time should be suited to each other, so that there is unity and balance in the whole costume. A small or medium tailored hat, for instance, gives a better balance than a large fancy one when worn with a tailored suit or a short close-fitting skirt.

Healthful Styles. You cannot be well dressed unless your clothes are healthful in style. All your clothes should permit absolute freedom of movement, so that the body can perform its functions properly and that you can do your work without hindrance. They should protect the body from moisture, from heat in summer and cold in winter, and maintain a constant body temperature. Avoid low-necked dresses, low shoes, very thin stockings and scant clothing in winter. Wear hats that are light and large enough in the head size to allow for free circulation. Give special attention to the fitting of your corsets. If not properly fitted, they often cause an atrophy of the abdominal muscles and interfere with the circulation of the blood. The corset should not press downward but upward, supporting the abdominal organs. It should fit snugly over the hips and allow plenty of freedom at the waist-line. Tight bands should not be worn on any part of the body. Wear shoes large enough for you and that are the shape of your foot, regardless of fashion. The wearing of tight shoes is a strain on the body and foot and causes various disorders. Shoes should fit the ankle, the arch and the heel snugly and should be straight on the inside line. The heel should be broad enough to balance the body properly and the sole thick enough to protect the foot from dampness. The toe should be broad enough to allow free movement of the foot. Wear rubbers in wet weather to keep the feet dry.

Styles for Thin Girls. If you are tall and thin, wear garments that make you appear shorter and broader. Broad collars and belts, ruffles, flounces, puffs on the hips, and trimming that forms horizontal lines are good. The neck-line should be high, round or square. Low hats and hair dressing decrease the apparent height. Avoid vertical lines, stripes, and points. Plate I gives suggestive styles for thin girls. Figures 1, 2, 4 and 6 of Plate IV also show good styles for thin girls.

Styles for Stout Girls. If you are short and stout, wear garments that make you appear taller and more slender. Vertical lines and panels give height, especially if placed near the center of the figure. Pointed effects in tunics, collars, and vests are good. If belts are worn, they should be narrow, curving downward at the waist-line or tied with long ends. The front of the dress may be made in one piece from the neck to the bottom and the belt come to each side of this panel. Avoid a definite break at the waist-line. One-piece dresses are better than shirt-waists and skirts. Russian blouses or waists with crushed low waist-lines are good. Pointed neck-lines or long lines from the neck to the waist give a long narrow effect. Avoid large collars, loose sleeves, tight short skirts, full tunics, horizontal trimmings, and draped effects above the knees. Be sure your clothes fit easily. Tight clothes make you look larger. Wear low-bust corsets and well-fitting brasieres. Wear underwear that will help you look slim, such as union suits and fitted combinations. Avoid gathers at the waist-line. Low shoes give height. Dark-colored shoes are better than light-colored ones. Wear hats that have width enough to frame the face and that are trimmed to give height. Avoid very large hats.

Plate II shows some good styles for stout girls, also Figure 1 of Plate IV.

Appropriate Styles. Consider the purpose for which a garment is to be worn when choosing the style of it. A house dress should permit abso-

PLATE I
Suggestive Styles for Thin Girls



1 and 2—House dresses. 3-5—Costumes for school, business, street, church, or travel. 6—Costume for church or afternoon social affairs. 7-8—Party dresses.

two undergarments, one of cotton next to the skin and one of wool over that. Cotton-and-wool mixtures are better than all wool for underwear, as they wear better, are easier to clean, and keep the body uniformly warm and dry. Silk-and-wool mixtures are good for underwear, but are expensive. Silk is pleasing and luxurious, but too costly for people of moderate means. Simply trimmed undergarments made of muslin, longcloth or cambric are good to wear over the porous garments worn next to the skin. It is an extravagance for people of limited means to wear silk underwear and hose for everyday use. Cotton or lisle hose are better for common wear. Warm heavy stockings should be worn in winter. White sateen petticoats are inexpensive and durable for summer. They are easy to launder and need no starch.

Gloves. Silk gloves or wash-kid gloves are more economical than kid gloves. Soft-gray or tan-silk gloves are good for general wear. They are in good taste, harmonize with most colors, do not soil easily, and wash well. White silk or kid gloves are appropriate for dress occasions.

Shoes. Kid shoes are soft, flexible, and easily cared for, and are therefore best for general wear. Gun-metal shoes are adapted to rough wear. They are heavier, less cool and not so easy as kid shoes. Patent-leather shoes are not durable, and are usually uncomfortable. Shoes with welt soles are the best kind. They turn water well, are durable, and easy to repair. Turned soles are suitable for comfort shoes. They are not watertight, lose shape easily, and are difficult to repair.

Sixth—Carefully look over your old clothes and decide which ones can be used as they are and which ones are worth remodeling. Consider the saving in the cost of new materials, the work of remaking and the durability and attractiveness of the garments when finished. Garments or materials may be dyed to correspond with the general color scheme of your wardrobe. Read the suggestions and directions on pages 29-32 for remodeling garments.

Seventh—Make a list of the new clothing you need to buy. Place opposite each garment the amount you can afford to pay for it. Set aside a sum for remodeling your old clothes; accessories, such as collars, cuffs, ties, belts, handkerchiefs, veils, handbags, umbrellas, etc.; for repairs; for cleaning and for emergency needs. Consult prices and revise your list. Much thought and careful planning may be necessary to make your money cover your needs.

Eighth—Decide what clothes are to be bought ready made and what ones are to be made at home. It is economy to make at least part of your clothes. Attractive high-grade ready-made garments are expensive. It is generally considered that garments made at home are of a better grade of material and workmanship, and therefore give longer service than those bought ready made. Touches of embroidery and other handwork and the clever use of trimmings make comparatively inexpensive dresses distinctive. If you are not of average figure, it will be hard for you to get ready-made clothes that will fit you. Make the clothes which you can do best and the most easily and on which is the greatest saving in money. Buy those which are hardest to make and which can be bought ready made of good quality.

Suggestions for Buying

PREPARATION. Carefully plan the complete wardrobe as given above before buying any clothes or materials. Then you will have definitely in mind just what kind of garments you want in color, style, and material, and how much you can afford to pay for them.

2. Then learn to know materials so that you can buy wisely and economically and so that you can get what you want and what you seem to be getting. You must be able to distinguish cotton, linen, wool, and silk, and to know the standard materials of each fiber. You must know how to judge the durability of fabrics (wearing quality, fastness of color, etc.) and how to detect adulterations. See "Study of Materials," page 11.

3. Find out what stores have the reputation of handling honest goods and what stores have specialties, as the best silks, the best shoes, etc.

4. Before buying materials, determine the exact amount you need. An extra quarter of a yard of high-priced goods is expensive. Purchase patterns and make alterations according to directions given on pages 26-29 of Sewing Bulletin No. 21. They lay the pieces of the pattern on a table and determine the amount of material needed of different widths.

How to Buy:

1. Buy slowly and carefully.
2. Buy only what you need and have planned to buy.
3. Consider the price in connection with the value of the garment.
4. Examine carefully the material and workmanship of ready-to-wear garments. Be sure the garment is becoming and appropriate in color and style. Consider the possibility and effect of slight changes. New collar and cuffs, removal of surplus trimming, or the addition of a touch of color may add greatly to the value and desirability of a garment.
5. In selecting materials for clothes be sure that the color is becoming to you. Hold the goods near the face in good daylight if it is to be worn in the daytime, and in artificial light if it is to be worn at night.
6. Choose good durable materials for clothes that will have hard wear.
7. Consider the width in relation to price and economy of cutting.
8. Get samples of materials which seem suitable. Take them home and test them for fiber, durability, adulterations, and fastness of color.
9. Before buying a hat, study the front, side, and back views, and note how its lines conform to the shape of the face and head. Wear the suit or dress with which the hat is to be worn, and study how it harmonizes in color and style with this. The hat is a part of the whole costume, and must be judged in that connection.
10. Buy gloves of standard make. Always have them fitted.
11. Buy hose of standard make, the color and wearing quality of which have been tested. Be sure they are large enough and long enough.
12. Have shoes carefully fitted. Buy good ones of standard make and simple style.

Things to Avoid:

1. Do not buy when very tired.
2. Do not buy garments or materials you have not planned to buy.
3. Avoid extremes, novelties and fads in style, color, or material. They are expensive and soon become tiresome.
4. Do not buy at bargain sales unless you are an expert in judging materials. Good value may sometimes be found at end-of-season sales. Conservative style should be chosen which will be good the next season.
5. Do not buy remnants unless they contain the exact amount of the kind of material that you need.

Study of Materials

In order to buy intelligently, you must be able to distinguish the different fibers; you must know standard materials and weaves and their suitability for different purposes; you must be able to judge the durability and quality of fabrics in relation to price, and you must know how to detect adulterations and substitutions.

HOW TO DISTINGUISH DIFFERENT FIBERS. Cotton, linen, wool, and silk are the four fibers commonly used for clothing. Experience will teach the good buyer to identify them by look and by feel. Practice with samples will enable any one to distinguish them in the following ways:

1. *Appearance of the Cloth.* (a) Cotton and wool have a low luster. (b) Linen and silk have a high luster.

2. *Feel of the Cloth.* (a) Cotton feels warm and soft. (b) Linen feels firm, cool, smooth, and leathery. (c) Wool feels warm and springy. (d) Silk feels warm and slippery.

3. *Crushing the Cloth in the Hand.* (a) Cotton crushes moderately easily. (b) Linen crushes very easily. (c) Wool does not wrinkle easily.

4. *Rubbing the Cloth Between the Hands.* (a) The surface of cotton cloth will become rough and fuzzy because of the ends of short fibers. (b) Linen will remain smooth.

5. *Biting the Cloth.* (a) Cotton crushes and becomes soft. (b) Linen is strong and smooth. (c) Wool is gritty and unpleasant. (d) Silk cuts.

6. *Tearing the Cloth.* (a) Cotton tears easily with a shrill sound, and the ends of the thread curl up. (b) Linen is hard to tear, and the ends of the threads are left uneven, stiff, and smooth. (c) Wool tears with difficulty, with a low muffled sound.

7. *Oil Test.* Place a drop of olive oil or glycerine on the cloth. (a) Cotton regains opaque. (b) Linen becomes transparent.

8. *Burning the Cloth.* (a) Cotton burns quickly with an odor of burning leaves; very little ash is left. (b) Linen burns more slowly with the same odor. (c) Wool burns slowly, chars, giving off an odor of burning hair or feathers; it leaves a charred gummy ball of ash. (d) Silk burns more readily than wool, giving off the same odor as wool; it leaves a small crisp ash or gummy ball unless weighted.

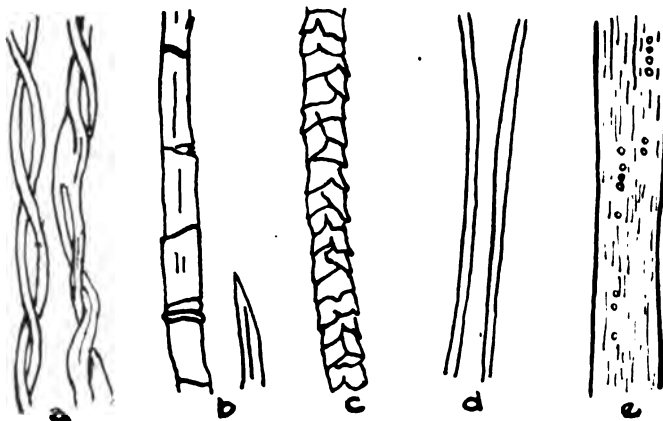
9. *Examine the Fibers with the Naked Eye.* To examine the fibers of which any material is made, ravel out both warp and woof threads and separate them into the fibers of which they are composed. (a) Cotton fibers appear short, dull, and fuzzy. (b) Linen fibers are long,

fine, smooth, and straight, with pointed uneven ends. (c) Wool fibers are short, bright, kinky, and stiff. (d) Silk fibers are long, fine, and smooth.

10. *Examine the Fibers under the Microscope.* (See Plate III.) (a) Cotton fibers appear ribbon-like, flat, and are twisted in spiral form. (b) Linen fibers appear cylindrical, with cross marks or intervals like joints in a corn stalk. (c) Wool fibers seem to be covered with scales that overlap like shingles and give the surface a saw-toothed appearance. (d) True silk fibers seem straight and transparent like glass rods. (e) Artificial silk fibers appear straight with lines and circles inside.

PLATE III

Appearance of Different Fibers Under the Microscope



(a) Cotton. (b) Linen. (c) Wool. (d) True silk. (e) Artificial silk.

CHARACTERISTICS AND SUITABILITY OF DIFFERENT FIBERS. *Cotton* is the least expensive fiber and is well adapted for many purposes. It is strong and elastic and a good conductor of heat when closely woven. It launders well, taking starch easily. This makes it especially good for house dresses, summer garments, and underclothing. When loosely woven, it is a poor conductor of heat, therefore is used extensively for winter underwear, blankets, etc. It leaves lint. It dyes well.

Mergerized Cotton is made by treating cotton yarn with chemicals and drying it under tension. This gives the cloth a high luster, and makes it smooth, lustrous, and strong. Mercerized cotton is excellent for many purposes.

Linen is expensive, but strong and durable. It is a good conductor of heat, which makes it desirable for summer clothing. It absorbs moisture easily and gives it up easily. It does not collect and hold dirt as cotton does, and does not stain easily. It is hard to dye and fades easily. Finely woven linens crush easily, and require frequent laundering, therefore are not good for outer garments. Linen crashes which do not crush easily are good for summer dresses and suits.

Wool, being porous and capable of holding air in its meshes, is a poor conductor of heat. Therefore it is valuable for winter garments and for blankets. It is easily affected by heat and sudden changes of

temperature. It absorbs moisture readily, but gives it up slowly. It is better for underwear if combined with silk or cotton. It is elastic, therefore does not wrinkle easily. It dyes easily, and holds its color well.

Silk is a poor conductor of heat, and absorbs moisture moderately. It is strong and tenacious, wears well when pure, and is soft and light in weight. It sheds dust, and is easily cleaned. It is seldom found pure except in pongee, rajah, and tussah silk. These are made from the cocoon of the uncultivated silkworm, and are called wild silks. The finest silk is that which is reeled or drawn from cocoons in which the chrysalis has been stifled by heat before it breaks the cocoon and injures the fiber. The spun silk is secured from various wastes, such as tangled fiber, wild silks that cannot be easily reeled, etc.

Artificial Silk is not silk. It is made by artificial means from wood pulp or cotton. Its chief characteristic is its high luster. It has a tendency to go to pieces in water. It is useful for articles that do not need constant washing, such as draperies, braids, sweaters, scarfs, and dresses.

STANDARD MATERIALS are those which have been known for years and the quality of which has been tested and proven. Make yourself familiar with their look, feel, and weight. Learn to know widths and prices and what to expect of materials of standard grade.

Standard Cotton Materials are calico, gingham, chambray, percale, muslin, longcloth, cambric, batiste, challis, corduroy, voile, sateen, lawn, India linen, Indian-head, galatea, dimity, flaxon, Canton flannel, nainsook, outing flannel, pique, poplin, and velveteen.

Standard Linen Materials are damask, huckaback, crash, handkerchief linen, butcher's linen, and dress linen.

Standard Wool Materials are serge, broadcloth, cashmere, flannel, Panama, Bedford cord, challis, cheviot, covert, and mohair. Two kinds of woolen yarn are used in making woolen fabrics. They are woolen and worsted. They can be distinguished by untwisting a piece of yarn and noticing how the fibers are formed into the thread. In woolen yarn the fibers are crossed in every direction. In worsted yarn the fibers lie smoothly in the direction of the thread, and are parallel to each other. Woolen is often softer than worsted, the yarn being more or less felted and the weave structure being covered up in finish as in broadcloth. Worsted shows the weave plainly, as in serge, is smooth and firm, and gives better service for the same money than woolen does.

Standard Silk Materials are chiffon, china silk, crepe de chine, foulard, crepe meteor, maline, pongee, plush, satin, messaline, taffeta and velvet.

The many novelty fabrics on the market encourage the demand for variety and change. Many new names, colors, weaves, and methods of finishing appear each season. A new novelty fabric sells at a higher price early in the season than it does later, and usually the lowest price is out of proportion to the quality of the material. Some of the new fabrics are really old standard fabrics under the disguise of new trade-names based on new methods used in the finishing process. These bring higher prices at first, but later find their place at a reasonable

price among the standard fabrics. Many fabrics appear as novelties at first, but later prove their wearing qualities and become standard.

STANDARD WEAVES.* The weakness or strength of cloth, aside from the quality of the yarn, depends upon the way in which it is woven. A fabric with close firm weave has a strength and durability that is entirely lacking in one made from the same yarn, but with a loose open weave. If the yarns in cloth pull apart along seams, if they are pushed on each other in laundering or in places where strain is applied, if they catch on rough surfaces, the fault is largely in the weave structure. Often novelty fabrics with fancy weave structure give very good service. The main standard weave designs are the plain or tabby, the diagonal or twill, and the fancy.

*The Plain or Tabby Weave** has the simplest alterations of threads, as voile, muslin, Panama, and brilliantine. Variations are found in the basket and rib or cord weaves, in which groups of two or more woof threads cross one, two, or more warp threads. In these weaves the threads cannot be pushed closely enough together to eliminate all spaces. Therefore plain weaves are used for materials in which spaces are desired between threads.

*The Diagonal or Twill Weave** always forms a diagonal line across the material as in serge, whipcord, gabardine, and denim. The satin weave is derived from the twill. The twill weave makes the firmest and most durable fabric unless the floating yarns are so long as to catch on obstructions.

Fancy Weaves are combinations of plain and diagonal weaves. Some of them, such as huckaback and birdseye, are now regarded as standard weaves. In general, fancy weaves should be avoided unless they are standard.

TESTS FOR DURABILITY. Materials to be durable must wear well and keep their color. In determining durability the purpose for which the material is to be used must be considered.

Strength Tests. 1. Stretch the cloth quickly and firmly, both lengthwise and crosswise. If it tears or frays in either direction, it lacks strength. Push the warp threads and then the woof threads back and forth to see if they move easily. If they can be pushed without difficulty and are soft and brittle, the material will be apt to pull and fray when strain is applied, as in seams.

2. Note how the warp threads compare in strength with the woof threads. A fine warp thread will not stand the strain of heavy woof threads. Material is not strong that has a heavy cord woven in beside a fine thread, as in dimity.

3. Examine the quality of the fibers of cloth by drawing out yarns and examining the single fibers.

4. With the aid of a linen tester determine the number of "counts"—that is, the number of warp threads and the number of woof threads—to the square inch. Materials having the greatest number of counts have the greatest durability, providing the threads are of the same size and quality.

Tests for Fastness of Color. Colors are fast to different things, such

*Taken from Special Bulletin No. 15, Minnesota.

as laundering, sunlight, dust, water, wind, perspiration, and general wear. Procure samples and test as follows, keeping pieces of the material to compare the samples with after testing:

1. Laundering—Wash the sample with soap and water and expose half of it to the sunlight.

2. Sun, air, light and general wear—Expose to sunlight for two weeks.

3. Water—Sprinkle the sample with water.

4. Mud—Apply splashes of mud.

5. Perspiration—Dip samples several times in acetic-acid water (1 teaspoon acetic acid to 1 quart of water) heated to 98°F.

ADULTERATIONS AND METHODS OF DETECTING THEM. There are many ways of treating fibers to change their character or of substituting one kind for another, all of which are legitimate if the materials are sold for what they really are. Club girls should work for pure-textile laws in order that the quality and price of materials may be standardized just as the pure-food laws regulate the manufacture of food. When people demand honest goods and refuse to buy any other kind, materials will be sold for what they really are.

Become familiar with the skilful devices by which manufacturers have succeeded in making goods appear to be what they are not, and learn how to detect adulterations. Below are given some of the common methods and tests for them.

By Combination. 1. Cotton is mixed with linen, especially in towelings which often have cotton warp threads and linen woof threads. Mercerized cotton is often mixed with linen, the luster making it difficult to detect. Cotton in linen may be detected by (a) examining the fibers and by the oil test as given under "How to Distinguish the Different Fibers," pages 11, 12, and (b) by the following chemical test: Wash the sample to remove the dressing. Dry in the fresh air. Immerse it for two or three minutes in concentrated sulphuric or hot muriatic acid. Cotton will dissolve; linen will remain practically unaffected.

2. Cotton is mixed with wool in various ways: (a) All-cotton yarns are woven with all wool, as in brilliantine, a cotton warp being used; this may be detected by the burning test given under "How to Distinguish the Different Fibers." (b) A cotton yarn is twisted with wool yarn, as in covert cloth. (c) Cotton and wool fibers are blended before spinning, as in flannel and blankets; a mixture of cotton in the yarn may be detected by boiling a sample in a solution of washing-soda, pearline, star naphtha or gold dust (5 tablespoons to 1 pint of soft water). The wool will be dissolved leaving the cotton unharmed.

3. Cotton or linen are mixed with silk; this may be detected by boiling a sample in washing-soda, as for cotton and wool; the silk will be dissolved.

By Substitutions. One fiber is often sold under the name of another, as cotton for wool or linen, linen for silk, mercerized cotton for linen or silk, or artificial silk for true silk. To detect this, use the tests given under "How to Distinguish the Different Fibers," or those given under "Adulteration by Combination." True silk may be told from artificial silk by boiling a sample in water. True silk shows no change, while

the artificial silk swells, and if a little alcohol or glycerine is added the fibers will contract. Another test is to place the sample in a solution of chromic acid. Make a saturated solution of the acid and add to this an equal amount of cold water. True silk will dissolve slowly, while artificial silk will dissolve rapidly.

By Sizing or Weighting. 1. The spaces between the threads of cotton materials are often filled with mixtures of glue, starch, and clay, which make the material seem finer and better than it really is. This may be detected as follows: (a) by the feeling, a large quantity making the material harsh; (b) by looking through the cloth in a good light to see if there is starch between the threads; (c) by rubbing it between the hands; or by tearing it quickly and noticing whether white dust flies into the air; and (d) by washing and boiling a sample to free it from the sizing and noting the coarseness and limpness of the material.

2. Silk is often heavily weighted with salts of tin, iron, or lead. Weighted silk is weak, and will soon crack and fall to pieces. If a piece of heavily weighted silk is burned, the ash will remain in the original form and weave. The ash left after burning pure silk will be in the form of a gummy ball.

By a False Finish. 1. Ordinary cotton is often heavily calendered to imitate mercerized cotton.

2. Dots are often printed or pasted on cotton to produce the effect of embroidered dotted swiss. If a sample is pressed with a hot iron, these dots will turn brown.

3. Cotton is finished to resemble linen.

4. Finishes are applied to conceal cheap materials.

By the Use of Waste or Made-Over Yarns. 1. Tow, which is a short fiber separated from the long fiber in the process of manufacture, is used with dressed linen or long fiber. It does not wear well, and the surface will rub up.

2. Shoddy or remanufactured wool is made by reducing old wool to the fiber state. It may be made into cloth and sold as new wool, or mixed with new wool or cotton. Its serviceability depends upon the quality of the waste from which it comes and the methods employed in its manufacture.

By False Weaves. Cotton is often woven to resemble serge, shepherd's plaid, foulard, crepe de chine, and pongee.

Color in Dress

IMPORTANCE. Color is one of the first things which attracts or repels in a costume. The color of your clothes expresses refinement and culture or the opposite. Therefore select colors very carefully. Be sure they are becoming to you and suited to the purpose for which they are to be used. Choose soft rich colors instead of bright gaudy ones.

BECOMINGNESS. Before buying ready-made garments, try them on. Before buying material for any garment, hold it up to the face and note its effect. The color should clear the complexion and bring out to advantage the coloring of the hair and eyes. It should be dull enough to form a background, so that the face will show to good advantage. If the garment is to be worn in the daytime, note the effect of the color in good daylight. If it is to be worn at night, try it in a good artificial

light. A color which is becoming in one material may not be so in another. There are so many shades and tones of the same color that you cannot depend upon any color, as blue, always being becoming to you because one shade of it is. Below are given some general ideas as to the becomingness of certain colors to certain types. Few people are true to type, however, so that it is always best to try colors as suggested above.

1. *Blondes with clear skin, golden hair, and blue eyes* find blue, green, pink, rose, white, black, gray, dark red, dark brown, and delicate yellow becoming.

2. *Blondes with clear skin and red or auburn hair* find blue, green, cream, ivory, fawn color, black, rich brown, pearl, and dove gray becoming.

3. *Brunettes with clear rosy skin, brown or gray eyes and brown or black hair* may wear dark red, yellow, dark and golden brown, tan, blue, pink, cream or ivory white, gray, black, and olive.

4. *Brunettes with pale or sallow complexion and dark eyes and hair* find cream white, brown, russet, crimson, old rose, and gold becoming.

5. *Intermediate Types with colorless hair, faded eyes, and sallow complexion* must avoid strong colors. They may wear rich cream or buff, tints of rose, champagne, orange, gold, and salmon.

6. *All Types.** (a) A line of some shade of white on the neck of a costume makes the color of the garment more soft and becoming.

(b) Transparent materials, such as chiffon and net, used on the neck of a costume are becoming.

(c) Mixed colors are worn more easily than pure intense colors.

(d) Very light or very dark shades are usually more becoming than the intermediate shades of any color.

(e) Yellow, neutralized or softened, is becoming to mixed types.

(f) The color of the hair and eyes can be emphasized by a touch of the same color in the costume.

SUITABILITY TO PURPOSE. For school, street, and business clothes, dark, mixed or grayed colors are always in good taste. A touch of bright color may be used in the trimming. For social affairs, light and bright colors are appropriate.

COLOR COMBINATIONS. There are three primary colors—red, blue, and yellow. From these all other colors are derived. By combining these in pairs the three secondary colors are formed; red and blue forming violet; blue and yellow forming green; and red and yellow forming orange. Each primary color is the complement of the secondary color formed by combining the other two primary colors. Thus red is the complement of green; blue is the complement of orange; and yellow is the complement of violet. Any color with its complement represents the three primary colors.

The eye demands the presence of the three primary colors. Therefore after looking at a bright pronounced color, the eye, when turned away often unconsciously sees the complement of this color. For this reason, red may give a pale face a greenish cast, green may give color to a pale face, and an intense blue or violet may make a pale face

*Taken from Textiles Circular No. 8, Nebraska.

appear sallow. These effects may be changed by using white, gray, or cream about the neck of a dress.

White intensifies a color. It brings out the pink in a face, but increases sallowness. Cream color counteracts yellow in the face. Gray makes an adjacent color less brilliant, but at the same time it takes on a tint of the complement of that color. Gray next to green appears faintly pink. Black dulls a color, therefore is good with warm or bright colors. It makes the face look pale. Black and white bring colors together.

One color will blend with another if it contains a small amount of the first color. Greenish blue will blend with greenish yellow. Medium blue will blend with rose that has a little blue in it. Complementary colors, as yellow and purple, red and green, orange and blue, emphasize each other. Good color combinations are violet and pale green, chocolate and bright blue, claret and buff, dark green and gold or tan, black and yellow, and rose and blue.

Nature furnishes suggestions for delightful color harmonies in the browns of the earth and trees and the greens and yellows of the vegetation; in the red and orange of the sunsets; in the blue and violet of the skies, and in the beautiful coloring of the flowers.

Treatment of Materials Before Making Them Into Garments

Cotton and Linen goods should be shrunk and the color set before making into garments. Place the material, folded, in hot water (2 cups of salt to 1 gallon of water) or hot vinegar water ($\frac{1}{2}$ cup vinegar to one gallon of water) and let it remain until the water is cool. Squeeze it out slightly, stretch it evenly on a line and let it partially dry; then press it with a moderately hot iron.

Wool should always be sponged before making it up. It is best to have the store at which you purchase it do it for you. If you do it yourself, proceed as follows: Place the material wrong side up on a large flat surface. Lay over it a heavy wet cloth; unbleached muslin is good. Press with a hot iron until the cloth is nearly dry, then remove the cloth and press the material itself. If the material has a nap, press it in the direction of the nap. If double-width material is used, it may be folded with the right side inside. The wet cloth usually needs to be applied to but one side, but each side should be pressed. A dark press-cloth is best to use on dark colors.

CARE OF CLOTHING

If you wish to be well dressed, you must keep your clothes fresh, clean, free from wrinkles, and in good repair. Clothes will last twice as long if cared for properly.

Daily Care

AIRING. All articles of clothing should be thoroughly aired after being worn. This will freshen them, and take away body odors. As soon as any garment is removed, put it on a hanger or on the back of a chair, and place where the air circulates freely. Coats, waists, dresses, and skirts should be placed on hangers. Put shoe-trees in shoes as soon as they are taken off and place to air so that the inside parts will be thoroughly aired and dried. The shoe-trees prevent wrinkles and keep the shoes in shape. If two pairs of shoes are worn alternately, each

pair will last longer than one pair worn every day. Remove gloves carefully by turning them wrong side out. Turn to the right side and inflate the fingers by blowing in them. Place in the air.

SHAKING AND BRUSHING. Shake cotton clothes thoroughly to remove dust and dirt. Brush hats and silk and wool garments carefully. Brush with the nap if there is any. Use a piece of velvet or a very soft brush for silk garments. Brush leather shoes with a lamb's-wool brush or clean with a dark oiled cloth and polish. An old stocking will do. Brush white shoes with a stiff brush, and clean with Bon Ami or whiten with French chalk. Dust is harder to remove if left on a garment.

REMOVAL OF SPOTS. After brushing garments, remove all spots. Clean collars and lower edges of sleeves. Remove spots from gloves with art gum. If spots are left in garments, they become harder to remove. Directions are given on pages 24-27 for removing all common spots and stains.

REMOVAL OF WRINKLES. Hanging clothes in the air often removes wrinkles. Slight wrinkles may often be removed by hanging a garment over a bathtub of steaming hot water and then letting it dry in the air. If the wrinkles are not removed by the above methods, the garment should be sponged and pressed according to directions given under "Sponging and Pressing."

WASHING. Silk hose and underwear will last longer if washed immediately after each wearing, as the perspiration, if left in, rots the fabric. All underwear and hose should be washed often. Wash mud from rubbers and wipe them dry.

REPAIRING. Sew on all loose trimmings, buttons, or other fastenings. Mend rips, and darn or patch holes and torn places. Keep clothes in repair. Do not wear a garment that needs repairing. If you do not have time to mend it, wear something else, laying it aside to be mended later.

PUTTING CLOTHES AWAY. As soon as they are aired, brushed, spotted and mended, put coats, dresses, waists, and skirts on hangers and place them in a closet. A pole through the closet for hangers saves space and allows each garment to hang free. Put covers over garments that soil easily. Fold underwear and place it on a shelf or in a drawer. Put shoe-trees in shoes and place them in shoe pockets or set them straight on shelves or on the closet floor. Put hats in covers or hat-boxes and place them on shelves. Keep the closet orderly. Air it often.

Pull the fingers of gloves gently into place, fold the thumb over the glove part, and put them away in pairs in long narrow boxes or baskets.

General Care

If clothes are cared for properly every day, so much extra time will not need to be given them for general cleaning. Occasionally they will need to be sponged and pressed, laundered or dry-cleaned, and generally repaired. They should be hung out of doors occasionally and aired well to supplement the daily or nightly airing. They should be carefully brushed, especially the inside of seams, under plaits, etc.

SPONGING AND PRESSING. Garments which are not soiled enough to

be washed or dry-cleaned may be freshened by sponging and pressing them. Brush well and remove spots and stains.

Sponging. Place on an ironing board and sponge lightly with clear water to remove wrinkles or with a mild soap solution, potato water, or bran water, and then clear water to remove grease and dirt.

Pressing will do much to keep clothing in shape, and thereby prolong its period of wear. They may or may not be sponged first as needed. Lay the garment on an ironing-board. A sleeveboard or a rolled magazine tied with a cord should be used for pressing sleeves. Cover heavy materials with heavy cloth and thin materials with thin cloth which has been thoroughly soaked in water and well wrung out. Iron with a hot iron until nearly dry. If it becomes absolutely dry, shine will appear on the garment. Hang the garment where there is a good circulation of air until it is thoroughly dry.

To remove shine from garments sponge the parts with ammonia water (1 tablespoon of household ammonia to 1 quart of water). Cover with a wet press-cloth, and iron until almost dry. Remove the cloth, and brush the garment with a stiff brush to raise the nap.

Bagginess at the knees of trousers and skirts or at the elbows of coats may be shrunk out by spreading the garment flat on the board, placing a well-dampened press-cloth over the baggy portion and pressing until the cloth is almost dry.

Laundering—General Directions and Preparations

1. Mend all holes in garments before laundering, as washing makes holes larger.

2. Remove spots and stains that ordinary laundering will not remove or that hot water and soap will set, as fruit and egg stains. Mark other spots with threads, as they do not always show plainly when the garment is wet.

3. Separate cotton, silk, and woolen materials, as each needs different laundering. Separate white garments from colored.

4. Prepare soap solution, soap jelly, or soap-bark solution, and household ammonia for use in laundering. Soap solution is better than the solid soap to use for all laundering, as it makes suds more quickly and cleans more evenly. Soap jelly is good for washing woollens. Add enough soap solution or jelly to make the wash water a good lather. Household ammonia is good to soften the water in which wool is washed.

SOAP SOLUTION

Dissolve 1 cake of white soap or 2 cups of soap flakes, chips, or scraps in 3 quarts of hot water. Keep in jar for use.

SOAP JELLY

Shave 1 cake of mild soap into 1 quart of soft water. Cook gently until dissolved. Then put it into a two-quart jar and fill with soft water.

SOAP-BARK SOLUTION

Boil 1 cup of soap bark (3 oz.) and 1 quart of water for 5 minutes. Cool, strain, and mix with wash water like ordinary soap solution or put the soap bark in a small thin bag and soap and squeeze it into the wash water.

HOUSEHOLD AMMONIA

Mix $\frac{1}{2}$ cup of concentrated ammonia with 3 cups of soft water. Concentrated ammonia may be purchased at the drug-store, and household ammonia made in the above way more cheaply than the dilute ammonia can be purchased. When diluting the ammonia, hold the bottle above the level of the eyes, as the ammonia gas rises when the bottle is opened. Keep bottle containing household ammonia tightly corked.

5. If the water is hard, soften it by adding 1 tablespoon of washing soda or borax to each gallon of water for laundering cotton or linen. For laundering wool or silk, use 4 tablespoons of household ammonia and 2 tablespoons of borax to each gallon of water. Wool and silk are injured by alkali, therefore never use washing powder or strong soap in laundering them.

Laundering of White Cotton or Linen. 1. Soak for a few hours in lukewarm soapy water to loosen the dirt.

2. Wash in soft, hot, soapy water by hand or machine. Wash the least soiled articles first. Rub only enough to get the garment clean.

3. If clothes are very soiled or seem yellow, place them in cold, soft, soapy water, bring them slowly to the boiling-point, and boil them from 5 to 10 minutes.

4. Rinse thoroughly in plenty of clean water until no more soil comes out in the rinse water. Use warm water at first so the soap will not harden. If all the soap is not rinsed out, bluing will often unite with it and make yellow spots on the clothes.

5. If clothes are dried in plenty of clear air and sunshine, bluing is not necessary. If bluing is used, be sure it does not form sediment in the water. Make a dark bluing water, and add enough to the final rinse water to give the desired shade. Do not get clothes too blue.

6. Starch makes garments stiff and keeps them clean longer. Prepare starch as follows: Place from 1 to 4 tablespoons of starch in a saucepan. Add 1 cup of cold water and stir until smooth. Add $\frac{1}{2}$ teaspoon of white fat or paraffin, $\frac{1}{2}$ teaspoon of borax, and 1 quart of boiling water. Boil until clear, stirring constantly. Strain, and use as hot as possible. Thin to the proper consistency. Put clothes in the starch wrong side out, wring them out as much as possible, and then pat to make the starch penetrate the fiber.

7. Be sure that the clothesline is perfectly clean and securely fastened. Hang clothes of one kind together. Pin them securely. Hang them in the sunshine if possible.

8. When dry remove each piece, shake it, fold it loosely and place in a basket.

9. Spread the clothes on a clean table. Sprinkle water on each article separately with the hand or whisk-broom. Roll tightly and let stand for several hours or over night, so that the moisture will spread through the material.

10. Iron with the threads, preferably lengthwise, until perfectly dry. Iron embroidery or lace on the wrong side over an extra pad to make the design stand out clearly. Hang the garments a short time in the air, then fold them evenly and put them away.

Laundering Colored Cotton or Linen. 1. Set the color as described under "Treatment of Materials Before Making Them Into Garments."

2. Wash in soft, lukewarm, soapy water. Use a mild soap. Do not rub soap on the garment. Knead rather than rub.

3. Rinse well and wring as dry as possible.

4. Starch if desired, and hang out at once. If just a little stiffness is required, dip in borax water.

5. Dry in a shady place.

6. Iron while slightly damp, or sprinkle lightly, and let stand only a short time. Iron on the wrong side for a dull finish like that on new gingham or on the right side to give a gloss.

Laundering Wool. 1. Brush or shake to free from dust.

2. Wash in soft, lukewarm, soapy water. Use soap jelly made from mild soap or soap-bark solution. Use 1 tablespoon of soap jelly to 2 quarts of water. Never rub soap on the goods. Squeeze and knead the wool in the suds. Rubbing wool hardens it.

3. Rinse twice in lukewarm water that is slightly soapy and to which $\frac{1}{4}$ tablespoon of glycerine per gallon has been added. This replaces the natural oil which has been removed from the wool by washing, and leaves it soft instead of harsh. High temperature or change of temperature of the water used in washing and rinsing wool causes it to contract and shrink, therefore the water used in washing and in rinsing should be lukewarm.

4. Press the water out with the hands or wring through a wringer. Do not twist or strain the goods.

5. Shake thoroughly to raise the nap.

6. Hang to dry on hangers or so as to preserve the original shape. Dry quickly at room temperature in a draught or, if warm, out of doors in a breeze.

7. While still damp, press on the wrong side, or if dry cover with a damp cloth and press on the right side. Use a warm, not a hot, iron.

*Laundering Sweaters and Knitted Scarfs.** 1. Brush thoroughly before wetting. Note the measurements. This is because, in washing, the garment is likely to be stretched out of shape and must be pulled back to the original size before drying.

2. Wash in soft, lukewarm, soapy water as in washing other woollen garments. Keep the sweater completely under the water while washing and rinsing it. Gather it together and keep one hand under it when lifting it from the water. Press out the water without wringing.

3. Stretch it into the original shape and size. Lay it front up over a bath towel or other absorbent cloth on a flat surface. When nearly dry, turn it over to dry the back.

*Laundering Silks.** 1. Wash in soft, lukewarm, soapy water. Do not rub soap on the silk. Wash quickly. Knead; do not rub.

2. Rinse thoroughly in lukewarm water. Squeeze the water out by pressing the garment in the hands or wring through a wringer with loose rollers. Do not twist.

3. Roll in a bath towel or other heavy absorbent cloth, and let stand for a half hour.

4. Iron on the wrong side with a warm, not hot, iron or place a cloth over the right side and press.

5. Silk gloves are more easily washed on the hands. Pin to dry

*Adapted from "Home Laundering for Club Members."

with the tips up. Wash and dry at night to prevent their turning yellow from the combined effect of light and moisture.

Laundering Ribbon.* Lay the ribbon flat on the table (a marble or porcelain surface is best) and wash it by sponging it with warm soapy water. Rinse by drawing it carefully through a bowl of clear water, being careful not to crumple it. Dry by laying it flat on the table. Draw the hand over it to make sure there are no air bubbles between it and the table. If desired to stiffen it, dip it in gum-arabic solution. (Dissolve 1 tablespoon gum arabic in 1 quart of boiling water. Strain through a cloth.) After dipping, squeeze gently and roll in a cloth. When partly dry, place cloth over it and iron with moderately hot iron.

Laundering Lace. Measure it before washing it or mark the outline on white paper if it is important to keep the original size and shape. Baste very delicate lace carefully on a piece of cotton cloth before washing, to prevent straining the lace. Wash in lukewarm soapy water, squeezing rather than rubbing out the dirt. Rinse thoroughly. Restore a faded cream or ecru color by rinsing in clear coffee or tea. The color of the liquid as seen through a glass held up to the light should be the same as that desired in the lace. Stretch the lace to dry on a padded board, pinning it into its original shape.

DRY CLEANING is cleaning without using water. Garments which are not washable or which are too delicate to be washed in soap and water should be dry cleaned. There are two methods of dry cleaning—one method requires the use of gasoline, benzine, or chloroform, which dissolves grease and frees the dirt; the other requires the use of magnesia, fuller's earth, or other powders which absorb the grease.

Cleaning with Liquids, such as Gasoline, Etc. 1. Gasoline will remove grease-spots, dust and dirt, but does not remove other spots, therefore, before beginning to dry-clean a garment, determine the nature of all spots and remove those which gasoline will not take out.

2. Mark the remaining spots by running a white thread around them, as they are hard to find when the garment is wet.

3. Work out of doors in the shade. Gasoline and benzine are very inflammable.

4. Test the gasoline as follows to see if it is free from dirt and moisture: Put a small amount in an earthen dish. It should evaporate quickly, leaving no stain, sediment, or moisture. If it contains either dirt or moisture, strain it through a thick cloth.

5. Pour the gasoline into a vessel large enough so that the garment may be entirely immersed in it. Dry soap shavings or commercial dry-cleaner may be added to the gasoline. Squeeze the fabric or work it up and down in the gasoline. Squeeze and work the places where the spots were marked.

6. Rinse in clean gasoline, changing it until the liquid is clear.

7. Hang the garment in the air until the gasoline evaporates. If odor remains, remove it by pressing, placing a damp cloth over the garment, or hang the garment in hot moist air before pressing.

8. The gasoline which has been used should be allowed to settle and then be strained through muslin. This gasoline may be used again for washing, but not for the final rinsing.

9. Kid gloves may be shaken up and down in a fruit jar partly filled

with gasoline, changing the gasoline until it remains clear, or they may be placed on the hands and washed in gasoline as in 5.

Cleaning with Powders. This method is given especially for cleaning collars or other parts which soil before the rest of the garment.

1. Brush the garment and remove or mark spots as given in 1 under "Cleaning with Liquids."

2. Warm the meal or powder.

3. Spread it on the material and rub it in with the hands or a brush. Let it remain several hours.

4. Renew the powder as it becomes soiled.

5. If one treatment is not enough, cover the soiled parts again with warm powder or meal and let it stand over night.

6. Brush all the powder from the garment.

7. Kid gloves may be cleaned by rubbing the soiled parts with corn meal moistened in enough gasoline to keep the meal from scratching the gloves. Dry them in the air.

Cleaning Velvet. 1. With Chloroform—Brush lightly on the right side with a sponge dipped in chloroform. Work in front of an open window or out of doors.

2. By Steaming—(a) Hold over the spout of a teakettle containing boiling water and when dry, brush carefully with a soft brush to raise the nap. (b) Place a hot iron between two bricks with the flat side of the iron up. Cover the hot surface with a damp cloth and then draw the velvet over it right side up. The steam rising through the velvet will remove the creases and raise the nap. When the velvet is dry, brush it with a fine soft brush. If stiffening is desired, sponge the wrong side with a little weak ammonia water to which gum arabic has been added.

Cleaning Hats. 1. Use salts of lemon, oxalic-acid solution, sulphur and lemon juice, or hydrogen peroxide to remove spots from straw hats and restore natural whiteness.

2. Brush felt hats thoroughly with a dry brush, then rub them the wrong way of the nap with a cloth wrung from benzine or ammonia.

Removal of Spots and Stains—Classes of Stain Removers. There are five kinds of stain removers as follows:

1. Absorbers, such as fuller's earth, magnesia, starch, corn meal. French chalk, talcum powder, and blotting-paper. These remove the grease by absorbing it.

2. Solvents, such as water, gasoline, benzine, chloroform, carbon tetrachloride, alcohol, and turpentine. These remove grease, oil, sugar, etc., by dissolving it.

(a) Cold water can be used safely on all materials except those that water spot, such as broadcloth and some silks and cottons.

(b) Hot water dissolves grease, but sets stains which contain protein, such as blood, milk, and egg stains. Therefore, determine the nature of the stain before using hot water.

(c) Gasoline, benzine, chloroform, and carbon tetrachloride dissolve grease. The first three are inflammable and should be used out of doors in the shade.

(d) Alcohol removes grease, grass and paint stains. Try it on a piece of the material of a garment before using it on the garment.

(e) Turpentine removes paint by dissolving the oil which holds the paint in the material.

3. Bleachers, such as Javelle water, hydrogen peroxide, oxalic acid, and potassium permanganate are used to bleach out fruit stains, mildew, and tea and coffee stains. Use Javelle water only on white cotton and linen, never on colored materials, wool or silk. Prepare bleachers as follows:

JAVELLE WATER

$\frac{1}{4}$ lb. chloride of lime,	$\frac{1}{2}$ lb. washing soda.
1 qt. cold water.	1 pt. boiling water.

Put soda in an agate pan and add boiling water. Dissolve the lime in the cold water. Let the mixture settle, and pour the liquid into the dissolved soda. Bottle and keep in a cool place.

Dilute for use with equal parts of warm water. Rinse the garment thoroughly in clear water and finally in ammonia and water.

POTASSIUM PERMANGANATE

Dissolve 1 teaspoon of potassium-permanganate crystals in 1 quart of warm water. Store in bottles. After applying, rinse stain in warm water, then apply dilute oxalic acid.

OXALIC ACID

Dissolve $\frac{1}{2}$ oz. of oxalic-acid crystals in $\frac{3}{4}$ cup of water. For a dilute solution, add an equal quantity of water.

4. Acids, such as lemon-juice, cream of tartar and oxalic acid, are used to remove stains containing iron, as iron-rust and some ink-stains.

5. Neutralizers. Some stains are taken out by neutralizing them—that is, treating them with a substance that has the opposite effect from that causing the stain. Stains made by acids are removed by alkaline substances, such as borax, ammonia, and soda. Alkaline stains are removed by acids.

Preparations for and General Directions. 1. Brush thoroughly the garments to be cleaned.

2. Have ready different kinds of stain removers as given above. The bottles containing these liquids should be plainly labeled, tightly corked, and placed where small children cannot get them.

3. Determine the nature of the stain and mark the spot with thread if necessary.

4. Consider the material which is stained. Strong alkalis destroy wool and silk, and strong acids destroy cotton and linen. If necessary to use alkalis on wool and silk or acids on linen and cotton, use them in very dilute form. Work quickly and rinse the fabric thoroughly in clear water, then in water containing alkali when acid has been used and acid when alkali has been used. Common acids are vinegar, lemon juice, cream of tartar, and oxalic acid. Common alkalis are borax, ammonia, soda, and hydrogen peroxide.

5. Use absorbers as follows: Rub in a thick coat on both sides of the spot. Allow it to stand several hours. If the stain is dried in, place blotting-paper over the powder and press with a hot iron. Remove the powder with a soft brush. Repeat the operation if necessary.

6. Apply solvents as follows: Place the garment right side down

with the spot over blotting-paper or a thick absorbent cloth. Apply the solvent from the wrong side, rubbing from the outer sides to the center of the spot. Use a piece of the same material, a brush or a tampon ball to apply the liquid. A tampon ball is made by tying cotton wadding into a piece of linen or cheesecloth. Use only a little solvent at a time. Dry and repeat the operation if necessary.

7. When applying bleachers, acids, and neutralizers, stretch the stained material over a bowl of hot water and drop a very little of the bleacher on the stain from a medicine dropper or a small glass rod. Rinse quickly by dipping the material into clear water and rubbing the stained part. Repeat until the stain is gone. Test the effect of all bleachers on a sample of the material of any garment before using it on the garment.

Removal of Different Stains. 1. Many stains may be removed by cold water. Try cold water first, then warm soapy water.

2. Acid Stain. Apply dilute ammonia and rinse in cold water.

3. Blood Stains. (a) Wash in cold water until the stain turns brown. Then wash in warm soapy water. (b) For stains on thick materials, apply a paste of raw starch, brushing it away when dry. Repeat until the stain is removed. (c) Sponge with hydrogen peroxide.

4. Chocolate or Cocoa. (a) Wash in warm soapy water. (b) Soak in cold borax water and rinse in boiling water. (c) Sponge stains in delicate fabrics with lukewarm water. (d) Spots of fat remaining after the above treatments should be removed like grease stains.

5. Coffee Stains. (a) Spread the stained part over a bowl and pour boiling water on it from a height of two or three feet so as to strike it with force. (b) Wash in soapy water and dry in the sun. (c) Use Javelle water or potassium permanganate for old stains which remain after other treatment. (d) Sponge stains on wool or silk materials with lukewarm water. (e) Remove stains from light-colored silk materials by placing damp cloths over the stains and pressing with a hot iron.

6. Fruit Stains. (a) Use treatment given under Coffee Stains (a). (b) If the material is white cotton or linen, soak it in boiling water to which an equal quantity of Javelle water has been added. (c) Sponge stains on delicate materials with warm water. (d) For peach stains, use glycerine or apply salt and lemon juice and expose to direct sunlight.

7. Grass Stains. (a) Use hot water and soap. (b) Wash in alcohol. (c) Rub with molasses if there is danger of fading the material. (d) Soak in ammonia water if the colors are not delicate. (e) Use hydrogen peroxide and ammonia.

8. Grease or Oil Stains may be removed by absorbers or solvents as given above. For wagon grease, cover stain with lard and then wash in warm soapy water.

9. Ink. (a) If the stain is fresh, place the stained part in sweet or sour milk and allow it to stand several hours, changing the milk as often as it becomes discolored, (b) Cover with salt and lemon juice and expose to direct sunlight. (c) Soak in hot vinegar. (d) Apply absorbers. (e) Use commercial ink eradicator.

10. Iodin. Soak in dilute ammonia.

11. Iron Rust. (a) Cover the stain with salt, moisten with lemon

juice and expose to direct sunlight. (b) Boil until stain disappears, in a rhubarb solution (boil 1 stalk of rhubarb in 1 cup of water); in a pineapple solution (boil 1 slice of pineapple in enough water to keep it from burning); or in a grape-fruit solution (boil the pulp and juice of one-fourth grape fruit in enough water to keep it from burning). Rinse thoroughly.

12. Machine Oil. (a) Wash in cold soapy water. (b) Rub with turpentine.

13. Mildew. (a) Saturate the spot with lemon juice and salt and expose to direct sunlight. (b) Soak in sour milk or buttermilk over night. (c) Cover spots with paste made of soft soap, one tablespoon of powdered starch and the juice of one lemon. Allow it to stand forty-eight hours. (d) Use Javelle water or potassium permanganate.

14. Milk, Egg or Cream Stains should be washed in cold water first to remove protein, then treated with warm soapy water or some other solvent.

15. Mud Stains. (a) Wash in soapy water. (b) Sponge with alcohol. (c) Rub stains on black material with cut, raw potato. Brush when dry.

16. Paint. (a) Rub with turpentine. (b) For delicate colors use chloroform or gasoline. (c) Soften with turpentine or lard and clean with gasoline. (d) Fresh stains may sometimes be removed with soap and water.

17. Perspiration. (a) Wash in soap and water and expose to sunlight. (b) Apply Javelle water or potassium permanganate.

18. Scorch. (a) Moisten and expose to direct sunlight. (b) Rub with soft bread crumbs.

19. Shoe Paste or Polish. (a) Wash in soapy water. (b) If from paste containing turpentine, sponge with turpentine. (c) Use Javelle water or potassium permanganate for stains from black liquid dressing.

20. Sugar or Syrup Stains. Wash in warm water.

21. Water Spots. Sponge the entire garment or shake it in the steam from a teakettle until damp, and then press.

REPAIR OF CLOTHING. One of the greatest helps in keeping clothing in good condition is to give immediate attention to repairs. This should be done each day, as given above, if possible. If time does not permit daily attention, garments should be put aside, and a day, or several hours at least, given to general mending before garments are laundered or dry cleaned.

Follow directions for darning and patching given in Sewing Bulletin No. 21. Badly worn-out feet in stockings may be replaced by new feet cut out from worn-out hose. Sometimes a tear in a garment not given hard usage may be mended invisibly by the use of mending tissue as follows: Lay the torn part of the garment wrong side up over an ironing board. Push the torn edges together. Cover the tear with a piece of mending tissue, with paste side down. Place a piece of cloth over the mending tissue and baste in position without letting the threads go through the tissue. Press with a hot iron. This melts the tissue, causing it to adhere to the garment. Remove bastings and trim off the edges of the piece of cloth which are not stuck down.

When the edges of coat-sleeves become worn, rip the hems, darn the worn places, and take slightly deeper hems to conceal the darning. If

the lower edge of a skirt is worn through, rip the hem, cut it off in the worn place and face the skirt with the piece cut off. If buttons or fastenings have pulled off, tearing the cloth, a strip of tape or a patch of the same material may be hemmed to each side of the garment and the fastenings sewed to this.

Corset. If corset stays have worn through the top of the corset, slip them down and stitch across the top of the corset, then rebind it with strong muslin. Replace worn stocking supporters.

Gloves. Rips in gloves should be mended when they first appear. If they are not, the gloves do not look neat and the kid may pull out of shape. Use a fine needle and thread as near the color of the gloves as possible. Cotton thread is better than silk for mending kid gloves, because silk thread tends to tear the kid. Sew small rips to match the original stitching. When mending a large hole or rip, blanket-stitch or buttonhole-stitch both edges and then overhand the edges together, taking up only the loops of the stitching. If gloves are split or torn, place a piece of thin material under the hole and darn fast to it or patch the hole with a piece of kid of similar color. Holes in silk or cotton gloves may be darned similarly to stockings, or they may be mended by button-hole stitching around the edge of the hole and then in these stitches, narrowing until the hole is filled. If a snapper pulls out, substitute an ordinary dress snap fastener, or have the dealer from whom the gloves were purchased replace it.

Shoes. Worn-off heels spoil the shape of the shoes and should be mended at once. Rubber heels prevent jar in walking and usually wear longer than leather heels. Shoes should be resoled before so badly worn that the inner stitching and leather are injured. Toe-plates or small patches on the toe of the sole will lengthen the life of the sole and improve appearances. Cracks across the top may be mended by placing a piece of leather underneath and stitching it fast to the shoe. Worn lining in the heel may be repaired with a piece of kid glove, velvet, or soft leather. Paste the piece on so as to cover the exposed counter and the worn edges of the lining, leaving the smooth side out. When the felt piece in the heel becomes loose or worn, a piece of kid, felt, or spongy cloth may be pasted in. Light-colored shoes which are scuffed may be made almost as fresh as new by dyeing them black.

STORING CLOTHES FOR THE SEASON. Garments should be thoroughly cleaned and repaired before being put away for the season. They should not have starch in them. It is a good plan to sun them well before putting them away. They should be stored so as to be protected against wrinkling, stretching, rubbing, dust, change of color, and insects. Coats, suits, skirts, and dresses that are not likely to stretch should be covered and hung in a closet. Covers for protecting garments may be made from worn night-dresses or sheets. Coat hangers may be made from old magazines. Roll the magazine tightly and tie a cord around the center, leaving a loop to suspend it by. Dresses and waists of delicate fabrics should be carefully folded and laid in separate boxes. Wrap delicate white garments in blue tissue paper to prevent their yellowing. Store garments of delicate color in the dark to prevent fading. Brush woolen and silk garments and furs inside and out to remove moth eggs, and wrap them carefully or store them in moth-proof bags in which some moth repellant has been placed. Wrap

hats in tissue paper and place them in roomy boxes to prevent them from being rubbed and marred. Felt or cloth hats, feathers, and fur trimmings must be protected against moths similarly to woollen garments. Rubbers should be stuffed with paper and placed where they will not get too hot or too cold.

REMODELING OF CLOTHING

Before buying new garments or materials for your wardrobe, carefully examine all your old clothes and those available of other members of the family, to see if some of them cannot be remodeled into attractive and durable garments.

Consider whether the materials are good enough to warrant making over; whether the color is becoming to you; whether they are appropriate in texture, color, and pattern for the purpose desired, and whether the result will justify the amount of labor required in remodeling.

Garments may be remodeled by changing them completely or by making slight alterations, such as lengthening the skirt, increasing or decreasing the waist size, changing certain parts, as sleeves, neck, collar, etc., or replacing worn parts. Two old garments, the colors and materials of which are suited to each other, may be combined to make one new garment, or new material may be purchased to go with the old. Plate IV shows different ways of combining materials in remodeling garments.

You may be able to make garments for yourself from old ones as follows:

1. A long coat, sport coat, dress, or skirt from your mother's old long coat.
2. A sport coat, dress, or skirt from your own old coat.
3. A dress or suit from your mother's old suit or from your own old suit.
4. A dress or jumper suit from an old full skirt.
5. A middy, waist, apron, or bloomers from an old plain skirt. Figure 1, Plate V, shows how to cut a middy from a skirt.
6. An outside skirt, petticoat, bloomers, or waist from an old dress.
7. A skirt, waist, middy, or apron from your father's old shirt. Figure 2, Plate V, shows how to cut a waist from a shirt.
8. Corset covers or camisoles from worn waists. See Figure 3, Plate V.
9. Chemise, petticoats, or bloomers from worn nightgowns. Figure 4, Plate V, shows how to cut a chemise from a gown.
10. Petticoats from princess slips.
11. House dresses that are worn in front and under the arms can be recut into kitchen aprons, using the back of the skirt for the front of the apron and part of the waist for the bib.

In partial remodeling, last year's dresses may be made over for this year by the addition of new sleeves, fresh collar and cuffs, or new trimming. Skirts may be lengthened or otherwise changed as follows:

1. Let out the hem and face the skirt.
2. If already faced and too short, rip off the facing, and make longer by putting a cuff around the bottom, using the same or different material.

PLATE IV

Suggestive Styles for Remodeling Garments, Combining Two Materials



3. Add a piece to the bottom, concealing the joining under a tuck.
4. If the skirt is gathered and has a high waist-line, it can be placed on a band and a wide belt worn over it.
5. A hip yoke may be added.
6. It may be shortened and worn as a tunic over a new foundation skirt.
7. A skirt too tight at the waist-line or over the hips may be made larger by raising it and letting down the hem to make it the right length, or it can be used as a tunic as suggested in 6 above.

Preparation of Old Garments for Remodeling

Ripping. Carefully rip up the garments to be used. Cut the threads with a safety-razor blade, or with a sharp knife, being careful not to cut the material. Pick and brush out all the threads.

Mending. Darn or otherwise mend torn parts that will have to be used.

Cleaning. Remove all spots and stains, and launder or dry-clean the material.

Dyeing. If desired to dye materials, follow directions given on pages under "Dyeing."

Pressing. Place a damp cloth on the side of the material that is to be the wrong side of the garment. Press until dry.

SELECTION AND PLACING OF PATTERN. Choose a pattern that your material will fit without much piecing. Be sure the style of the pattern is suited to you and to the purpose for which the garment is to be used. Make alterations in the pattern and place it on the goods according to directions given in Sewing Bulletin No. 21, pages 26-29. Lay all the pieces of the pattern on the material before cutting any, in order to find the best arrangement, and waste no material. It may take careful planning and much rearranging to get all the pieces of the pattern placed on the cloth as they should be. When piecing is necessary, try to have it come where it will not show much or where you can place over it a tuck, plait, buttons, braid, embroidery, or other trimming.

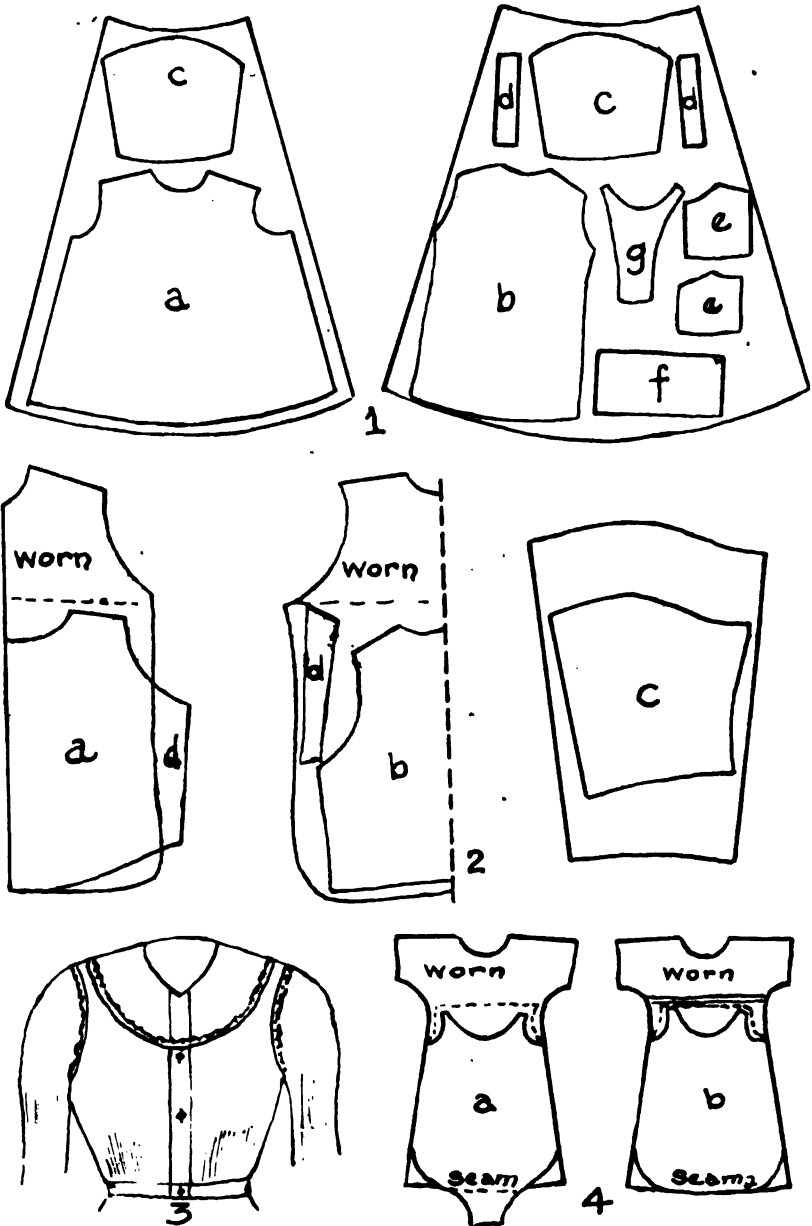
COMBINATION OF MATERIALS. In combining materials be sure that they harmonize in color and in kind. Silk may be used with silk or with wool; wool with wool, and cotton with cotton. Plaid or striped material may be used to brighten dark plain colors, but the plain color should appear in the plaid or stripe, so that there will be harmony of colors.

Do not buy new materials unless the old material is good enough in quality to wear long enough to justify the expense. Do not use expensive new materials or trimmings with old goods. Unused material, like that of the old garment to be remodeled, may be faded to match the old garment by hanging it in the sun or by washing it.

Dyeing

Nothing will help renew the appearance of your old clothes more than the use of dyes. If you follow directions carefully, you can dye old materials or garments at home with satisfactory results. You must know whether the material to be dyed is all cotton, linen, wool, or silk, or whether it is of mixed fibers. You must consider the original color as well as the color which it is to be dyed. Material must be dyed the

PLATE V—Cutting New Garments from Old Ones



*1. Cutting of Middy Blouse from Worn Skirt: (a) front, (b) back, (c) sleeves, (d) cuffs, (e) collar, (f) collar facing, (g) front facing.

*2. Cutting of Waist from Worn Shirt: (a) front, (b) back, (c) sleeves, (d) piecing for front.

†3. Cutting of Corset Cover from Worn Waist.

†4. Cutting of Chemise from Worn Gown: (a) front, (b) back.

*Taken from Circular No. 68, Arkansas Extension Division.

†Taken from Circular No. 91, Wisconsin Extension Division.

same color or a darker one. It cannot be dyed a lighter color unless the original color is removed.

SELECTING THE COLOR. White goods may be dyed any color. Any color may be dyed the same color, a darker shade of the same color, or black.

You should understand the effect of colors upon each other before trying to dye. Study "Color Combinations," pages 17, 18. Learn the primary, secondary and complementary colors. The combination of two colors often produces a different color than is expected. For instance, if blue material is dipped in yellow dye, it will become green and yellow; dyed with blue, it will become green. Red and blue produce violet, and red and yellow produce orange.

*When a primary color is too brilliant, you can soften it by dipping the material alternately into baths of the other two primary colors. This is sometimes called topping. For instance, when dry, give a garment dyed yellow a quick dip in red and when dry give it a quick dip in blue dye. Blue may be dipped in red and then in yellow, and red may be dipped in blue and then in yellow. A color may also be softened by dipping it into its complementary color.

*Always experiment on a sample of the material to be dyed until the result is satisfactory before trying the color on the material.

REMOVAL OF COLORS. *From Cotton and Linen Goods.* (a) Boil the material in a solution of washing soda (2 tablespoons soda to 1 gallon of water). Rinse thoroughly to remove the washing soda, as it injures the fabric. (b) Soak in Javelle water made according to recipe given on page 25. Use 1 cup of Javelle water to 2 gallons of water. Rinse thoroughly.

From Silk and Wool. (a) Soak in hydrogen-peroxide water (1 pint of hydrogen peroxide and a few drops of ammonia to 10 pints of lukewarm water) for several hours. (b) The color may often be removed from silk by boiling it in heavy suds made by dissolving a mild soap in enough soft water to cover the garment. Change the water as the color comes out.

SELECTION OF DYE. Test the material, according to directions given under "Study of Materials," page 11, to decide whether it is cotton, wool, silk, or mixed goods. If the material is cotton or linen or a mixture of cotton with linen, silk, or wool, use cotton dye. If the material is silk or wool, use dye for silk and wool.

PREPARATION OF MATERIAL TO BE DYED. 1. If the garment is to be made over, rip it up before dyeing it. If to be dyed whole, rip out the hems, tucks, and plaits, and remove the lining and trimmings.

2. Weigh the material.

3. Remove all spots and stains, and wash well according to directions given above for different materials. Dye while wet.

PREPARATIONS FOR DYE BATH. 1. Dissolve the dye thoroughly in a quart of hot soft water.

2. Strain slowly through two thicknesses of cheesecloth into a clean agate, enamel, brass, or copper kettle (do not use tin or galvanized-iron utensils, as they injure the dyeing qualities of the dye) containing

*Taken from "Home Dyeing for Club Members," States Relations Service.

three gallons of water for every pound of material, or enough water to cover the material and allow it to float. Stir well.

*3. For *cotton* materials add *salt* equal to one-fifth of the weight of the material to be dyed. This makes level and even shades. For *silk* or *wool* add the same proportion of *salt* and 2 tablespoons of strained *vinegar* to every pound of the material. Stir well. The acid causes the dye to penetrate the material better.

*4. Test the shade of the dye on a sample of the material to be dyed. By holding the wet sample against the light you can judge approximately the shade it will be when dry. The color looks darker when wet. Dry the sample if you want to be sure of the final effect. If the color is too light, add more dye until the desired shade is reached. If too deep, add more water.

*DYEING PROCESS. Stir the dye before immersing the material in it. Wet the material in warm water before immersing it, otherwise it will dye unevenly. Spread out the folds of the material as it is immersed. Stir the material about with a smooth wooden stick to prevent spots, streaks, and heat wrinkles. Heat the dye gradually to the boiling-point. Boil at least half an hour, or until the desired shade is reached. Boiling deepens the shade. If the material is allowed to cool in the dye kettle, the shade will be deeper and the color more fast.

**Care After Dyeing.* 1. Rinse thoroughly in cold water, changing the water until it becomes clear.

2. Squeeze carefully. Use two rounded sticks with rounded ends to press out water from the pieces.

3. Shake the material until nearly dry. Spread it out in the house or in the shade until dry enough to press.

4. Press while slightly damp.

TINTING. Light-colored ribbons, ties, dresses, waists, and underwear may be tinted with soap dyes by following the directions given on the package. A tinting water may be prepared by soaking in it colored crepe or blotting paper or by mixing a few drops of colored ink in clear water. A glass of tinted water held to the light will show about the same color that it will give to the material.

†*Freshening Hats and Trimmings.* 1. Remove spots from light-colored straw hats and then restore the original color by applying a solution of the desired tint made of oil paint and gasoline. Put it on quickly and evenly to avoid streaking.

2. If the hat is very badly soiled and sunburned, change the color to a darker one by applying a commercial hat dye.

3. Restore the color of artificial flowers by painting them with oil paint. Place some of the paint in a cup and add enough gasoline to make the paint the desired shade. Apply with a small brush to the flowers. Water colors may be used.

4. Soiled feathers, such as ostrich, aigrettes, etc., should be dry-cleaned or washed gently in a soapy lather, rinsed in clear water, and dried carefully before coloring them. To restore the color, dip in a solution of oil paint.

*Taken from "Home Dyeing for Club Members," States Relations Service.

†Taken from "The Renovation of Clothing," South Carolina Bulletin.

Uses for Discarded Garments

1. Worn-out parts of woolen or cotton underwear and stockings make braided, hooked, or woven rugs.

2. Parts of old tablecloths may be recut for napkins and for covering parts of the tablecloth to save soil.

3. Stockings may be made into skirts, tights, holders, sleeve protectors, mops, or dustcloths.

4. Silk may be made into cloths for polishing furniture.

5. Rain-coats may be made into waterproof blankets, swimming-bags, rainproof hats, or sleeping-porch screens.





CARSON CITY, NEVADA

STATE PRINTING OFFICE : : JOE FARNSWORTH, SUPERINTENDENT

1920

VETOED LEGISLATIVE BILLS

OF THE

Twenty-Ninth Session, 1919

WITH

ACCOMPANYING VETO MESSAGES



CARSON CITY, NEVADA

STATE PRINTING OFFICE : : : JOE FARNSWORTH, SUPERINTENDENT
1920

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VETOED LEGISLATIVE BILLS WITH MESSAGES

Senate Bills

SENATE BILL No. 4

Introduced by Senator Kenney, January 24, 1919

AN ACT to amend an Act entitled "An Act to provide for the establishment of evening schools," approved March 24, 1917.

The People of the State of Nevada, represented in Senate and Assembly, do enact as follows:

SECTION 1. Section one of the above-entitled act is hereby amended to read as follows:

Section 1. The state superintendent of public instruction shall authorize any local board of school trustees to establish evening schools in any school district whenever ten or more bona-fide applicants residing therein, over fourteen years of age not already attending a day school under public supervision, shall petition him in writing for the same. Such schools shall be open to native- and foreign-born youths and adults, and the courses of instruction therein given shall be approved by the state board of education.

SEC. 2. Section three of the above-entitled act is hereby amended to read as follows:

Section 3. No more than one teacher shall be employed for each ten persons enrolled in any such evening school. At the end of each school month the board of trustees having charge thereof shall certify the month's enrollment and average nightly attendance to the state superintendent of public instruction. The State of Nevada shall pay said teachers at the rate of not more than two dollars per hour of actual teaching in said evening schools, or not more than eighty dollars per month; *provided*, that when the average monthly attendance falls below eight students per teacher a sufficient number of teachers must be retired to maintain such an average.

SEC. 3. Section four of the above-entitled act is hereby amended to read as follows:

Section 4. The sum of ten thousand dollars is hereby appropriated from the state distributive school fund to carry out the provisions of this act, to be expended for the support and maintenance of such evening schools until the government of the United States provides funds for a similar purpose and then to be expended in cooperation with such federal statutes appropriating funds for evening schools; and claims against said appropriations shall be paid as other claims against the state are paid, upon certificate by the state superintendent of public instruction.

SEC. 4. Section 5 of an act entitled "An Act to provide

for the establishment of evening schools," approved March 24, 1917, is hereby repealed.

VETO MESSAGE

EXECUTIVE DEPARTMENT,
CARSON CITY, NEVADA, April 1, 1919.

HON. GEORGE BRODIGAN, *Secretary of State, Carson City, Nevada.*

SIR: I am depositing with you, without my approval, Senate Bill No. 4, entitled "An Act to amend an Act entitled 'An Act to provide for the establishment of evening schools,' approved March 24, 1917."

This Act carries with it an appropriation of \$10,000 from the State Distributive School Fund.

I am advised by the Superintendent of Public Instruction that no provision was made in his department budget for this additional money from the fund named.

The repeal of section 5 of the Act of 1917, of which this measure is amendatory, takes from the law the desirable cooperative feature which makes the evening schools of the State joint local and state enterprises.

Doubtless, existing laws will permit a continuance of the work thus far undertaken and will perhaps provide for cooperation with the Federal Government should the latter make provision for the carrying on of this work at joint federal and state expense.

Respectfully submitted,

EMMET D. BOYLE,
Governor.

SENATE BILL No. 72

As reported from Committee of the Whole, March 13, 1919

AN ACT to provide for the organization, control and equipment of high-school cadet companies, and for the promotion of rifle practice therein, and appropriating the sum of ten thousand dollars therefor.

The People of the State of Nevada, represented in Senate and Assembly, do enact as follows:

SECTION 1. The male students of any high school in this state may, upon application of the principal or governing board of the school, be organized into a high-school cadet company or companies under rules and regulations to be prescribed by the adjutant-general of Nevada. The moral, educational and physical welfare of such cadets shall be under the guidance of the principal of the school which such cadets attend, and such principal may, in his discretion, enlist other youths in such company or companies who are not actual students at such high schools.

SEC. 2. Said companies shall each have one captain, one first lieutenant, one second lieutenant, appointed and commissioned by the adjutant-general, State of Nevada, upon the recommendation of the commandant of cadets, herein

provided for, and with the approval of the principal, and such noncommissioned officers and privates as correspond to the noncommissioned officers and privates of the infantry companies of the national guard of Nevada, the noncommissioned officers to be appointed and warranted by the commandant of cadets, with the approval of the principal.

SEC. 3. Any commissioned officer, or noncommissioned officer, may have his commission or warrant canceled, and be reduced to the ranks, upon the recommendation of the principal of the high school, for falling back in his studies, or for misbehavior, either in school or in the cadet company, or for other good cause appearing in the judgment of the principal.

SEC. 4. All cadet officers shall be appointed from the senior and junior classes of high schools.

SEC. 5. Said high-school cadets shall have drill in accordance with the military instructions prescribed for the reserve officers' training corps, Junior Division, United States army.

SEC. 6. Said high-school cadets shall wear a uniform similar to that prescribed for the reserve officers' training corps, except that distinctive collar ornaments shall be worn.

SEC. 7. Target practice shall constitute a part of the instruction to be given to said cadets, and the adjutant-general, State of Nevada, shall purchase and supply to each of said high schools a sufficient number of uniforms and of Springfield or other efficient rifles for field target work and for gallery practice, and ammunition and equipment therefor, as in his judgment shall be necessary for efficient rifle practice. All target practice and drill shall be under supervision of the commandant of cadets or the principal. The expenditures therefor may be paid out of the moneys appropriated for the maintenance of the Nevada high-school cadets.

SEC. 8. The principal of the school shall be responsible for all public property supplied to said cadet companies, and shall supervise the proper care thereof.

SEC. 9. Upon the recommendation of the adjutant-general, State of Nevada, and with the approval of the school board having jurisdiction over the high school, the governor may commission a commandant of cadets for duty in each high school having one or more cadet companies. This officer shall be commissioned major and commandant of cadets, State of Nevada, and shall hold office at the pleasure of the governor, or until his successor has been appointed and qualified, or until his connection with the cadets is severed. Said major and commandant of cadets shall wear a uniform similar to that prescribed for the reserve officers' training corps, except that distinctive collar ornaments shall be worn. The adjutant-general will provide for and determine the amount of compensation to be paid the commandant of cadets out of the appropriation contained herein. The amount thus paid to be regulated by the amount of service rendered in the performance of his duties as commandant of cadets.

SEC. 10. Every county board of education, the state board of education, boards of trustees, and the state superintendent of public instruction, and deputy superintendents of public instruction, are, and each is hereby authorized, empowered and directed to facilitate the purposes of this act, by cooperating with the adjutant-general, State of Nevada.

SEC. 11. All military instruction given in the high schools of this state, shall coordinate with existing, or future, physical education adopted by said high schools.

SEC. 12. The adjutant-general of Nevada shall have general supervision and control over all military instruction given in the high schools of this state, and he may, in his discretion, inspect or cause a member of his staff to inspect any cadet unit in said high schools. The expense incidental to such inspection shall be paid out of the appropriation contained herein.

The adjutant-general may require all commandants of cadets to make appropriate reports and returns to his office concerning their respective units.

SEC. 13. The sum of ten thousand dollars is hereby appropriated from the general fund of the State of Nevada for the purpose of carrying out the provisions of this act.

VETO MESSAGE

EXECUTIVE DEPARTMENT,
CARSON CITY, NEVADA, April 1, 1919.

HON. GEORGE BRODIGAN, *Secretary of State, Carson City, Nevada.*

SIR: I am depositing with you, without my approval, reprinted copy of Senate Bill No. 72, as reported from Committee of the Whole, March 13, 1919, entitled "An Act to provide for the organization, control and equipment of high-school cadet companies, and for the promotion of rifle practice therein, and appropriating the sum of ten thousand dollars therefor."

This measure provides an appropriation of \$10,000 for the organization, on petition of the male students of any high school, of such students and others into a cadet company or cadet companies; for the prescription of rules and regulations for the government of such organizations; for the commissioning by the State of cadet officers; for the supplying at the expense of the State of uniform, rifles, range equipment and other accessories, and for the compensation of drill-masters.

High-school cadet companies are and have been organized in several communities in Nevada, and no additional law is needed to permit such organizations. The matter is one for local initiative; it is not a compulsory feature of the educational system, nor would it be under the bill before me. The Adjutant-General may, doubtless, prescribe rules and regulations and may certify to commissions given without law on the subject. I can see no justification at this time for a state appropriation in the premises.

Respectfully submitted,

EMMET D. BOYLE,
Governor.

Assembly Bills**ASSEMBLY BILL No. 25**

Introduced by Mrs. Hurst, January 30, 1919

AN ACT to promote the better education of nurses and the better care of the sick in the State of Nevada, to provide for and regulate the examination and registration of graduate nurses, and to provide for the issuance of certificates of registration as registered nurses to qualified applicants by the State Board of Health.

The People of the State of Nevada, represented in Senate and Assembly, do enact as follows:

SECTION 1. Department of Examination and Registration of Graduate Nurses—Director. Within thirty days after this act takes effect the state board of health shall establish and maintain a department of examination and registration of graduate nurses, as hereinafter provided. The state board of health shall appoint a director, whose salary shall be fixed by the board, and said director shall have been graduated from an accredited training school for nurses, as defined in this act, and shall be duly registered under the provision of this act. Said director shall perform all duties required by this act, and such other duties as may be required by the state board of health, in order to carry out the objects and purposes of this act. Lists of accredited training schools for nurses and a register of the names of all nurses duly registered under this act shall be prepared and kept by the department. An annual report shall be prepared and filed before January first of each year; *provided*, that any salary paid said director shall be paid from any moneys paid as fees for examination as defined in this act.

SEC. 2. Examination—Examination Fee. Examinations as provided for in this act shall be held at least every six months at such times and places as the board shall direct and according to the rules and regulations of said board. Public notice of such examination shall be given by publishing the same at least two weeks prior to the date of each examination in one or more papers of general circulation, to be selected by said board; all of said papers shall be published within the State of Nevada. Upon filing application for examination each applicant shall pay an examination fee of ten dollars, which shall in no case be returned to the applicant. No further fee shall be required for registration. Examination may be conducted by the state board of health, or by a special committee of three examiners to be appointed by the board at least thirty days prior to each examination, under such rules and regulations as may be prescribed by said board. If such special committee of examiners be

appointed, they shall prepare and submit to the board, at least ten days prior to the examination, all questions for such examination which may be approved, rejected, changed or altered in any manner by and at the direction of said board. All expenses of conducting said examinations shall be paid from the fund hereinafter mentioned in the manner therein provided. If the examination be conducted by said examiners, they shall mark all examination papers of applicants and render to the board within ten days thereafter, a report of the same in such form as may be prescribed by the board, which may change the grading of any paper. The board shall finally pass or reject all applicants, and its action shall be final and conclusive and not subject to review by any court or other authority. The board shall issue to each successful applicant a certificate provided for in this act.

SEC. 3. *Registration Without Examination.* All applicants for registration shall be registered without examination; *provided*, they make application prior to July 1, 1919, and have graduated before said date from a reputable training school connected with a general hospital, or have practiced for four years prior to the passage of this act as practical nurses continuously under the supervision of competent ethical state and Nevada licensed physicians with degree of M.D. or in any recognized reputable hospitals within the State of Nevada.

SEC. 4. *Registration After July 1, 1919.* On and after July 1, 1919, no person shall be eligible for examination or for registration as a registered nurse who shall not furnish satisfactory evidence of having been graduated from an accredited training school for nurses. An accredited training school for nurses within the meaning of this act is hereby defined to be a school for the training of nurses attached to or operated in connection with a hospital or hospitals giving a general training and a systematic theoretical and practical course of instruction. All applicants for examination must furnish satisfactory evidence of good moral character, and of having complied with the provisions of this act relative to qualifying.

SEC. 5. *Registered Nurse.* A nurse who has received his or her certificate according to the provisions of this act, shall be styled and known as a registered nurse, and shall be entitled to place the initials "R. N." after his or her name.

SEC. 6. *Nursing by Friends Not Affected.* This act shall not be construed to affect or apply to the gratuitous nursing of the sick by friends or members of the family, or to any person nursing the sick for hire who does not in any way assume to be a registered nurse.

SEC. 7. *Unlawful to Pretend To Be "R. N."* It shall be unlawful for any person not holding a certificate of registration issued by the state board of health to use the title "registered nurse" or the letters "R. N." in connection with, or following his or her name, or to impersonate in any manner, or pretend to be, a "registered nurse."

SEC. 8. *Registration of Nurses from Other States.* The board, upon written application, and upon the receipt of ten dollars as registration fee, shall issue a certificate of registration without examination to any applicant who has been duly registered as a registered nurse under the laws of another state or foreign country having requirements equivalent to those provided for by this act.

SEC. 9. *Revocation of Certificate.* The board shall have power to revoke any certificate of registration for dishonesty, intemperance, immorality, unprofessional conduct, or any habit rendering a nurse unfit or unsafe to care for the sick, after a full and fair investigation of the charges preferred against the accused.

SEC. 10. *Penalty.* Any person violating any of the provisions of this act shall be guilty of a misdemeanor, and shall upon conviction be fined not less than ten dollars nor more than one hundred dollars for the first offense and not less than fifty dollars nor more than five hundred dollars for each subsequent offense.

SEC. 11. *Monthly Report of Receipts.* Within ten days after the beginning of each month the secretary of the state board of health shall report to the controller the amount and source of all collections made under the provisions of this act, and at the same time all such amounts shall be paid into the state treasury to the credit of a special fund to be known as the "fund for examination and registration of nurses." All amounts paid into this fund shall be held subject to the order of the state board of health, to be used only for the purpose of meeting necessary expenses in the performance of the special duties imposed by this act. Claims against the fund shall be audited by the state board of health and by the board of examiners and shall be paid by the state treasurer upon warrants drawn by the state controller.

VETO MESSAGE

EXECUTIVE DEPARTMENT,
CARSON CITY, NEVADA, March 29, 1919.

HON. GEORGE BRODIGAN, *Secretary of State, Carson City, Nevada.*

SIR: I am depositing with you, without my approval, Assembly Bill No. 25, entitled "An Act to promote the better education of nurses and the better care of the sick in the State of Nevada, to provide for and regulate the examination and registration of graduate nurses, and to provide for the issuance of certificates of registration as registered nurses to qualified applicants by the State Board of Health."

This bill, while presuming to establish qualifications for registered nurses, fails to establish a standard which would be recognized either by the Government or by other States of the Union.

Respectfully submitted,

EMMET D. BOYLE,
Governor.

ASSEMBLY BILL No. 138

Introduced by Mr. Marsh, February 26, 1919

AN ACT to amend an Act entitled "An Act to provide for the government of the State Prison of the State of Nevada," approved March 7, 1873.

The People of the State of Nevada, represented in Senate and Assembly, do enact as follows:

SECTION 1. Section 9 of the above-entitled act, being section 7569, Revised Laws, 1912, shall be amended to read as follows:

Section 9. The board of commissioners may, in their discretion, cause the prisoners, or any number of them, to be employed in any mechanical pursuits, and at hard labor, and furnish such convicts thus employed with any material that may be deemed necessary, in the same manner as is provided for the furnishing of supplies and stores to the state prison, and they shall, in all respects, have the exclusive control of the employment of the convicts, and may from time to time employ them in such manner as, in their option, will best subserve the interest of the state and welfare of the prisoners; *provided*, that the commissioners shall not permit or allow the employment of any prisoner or prisoners upon any other than public work of general advantage to the state, or to the upkeep or development of the prison or prison farm; it being the specific intention hereof that no prison labor shall, except by express direction of the legislature, perform services in competition with free labor.

VETO MESSAGE

EXECUTIVE DEPARTMENT,
CARSON CITY, NEVADA, April 1, 1919.

HON. GEORGE BRODIGAN, *Secretary of State, Carson City, Nevada.*

SIR: I am depositing with you, without my approval, Assembly Bill No. 138, entitled "An Act to amend an Act entitled 'An Act to provide for the government of the State Prison of the State of Nevada,' approved March 7, 1873."

While generally favorable to the proposition that prison labor should not be used indiscriminately in competition with free labor, this measure is susceptible of an interpretation which might go so far as to prohibit the exchange of institutional products, the utilization in full measure of the prison farm facilities and the utilization of the prisoners in employment which in no wise affects free labor in Nevada and to the detriment of the general public.

Respectfully submitted,

EMMET D. BOYLE,
Governor.

ASSEMBLY BILL No. 156

Introduced by Mr. Murphy, February 27, 1919

AN ACT making an appropriation for the control and eradication of rabbits and ground squirrels within the State of Nevada, in cooperation with the Biological Survey of the United States Department of Agriculture.

The People of the State of Nevada, represented in Senate and Assembly, do enact as follows:

SECTION 1. For the purpose of cooperating with the biological survey of the United States Department of Agriculture, for the control and eradication of rabbits, rodents, and ground squirrels within the State of Nevada, there is hereby appropriated ten thousand (\$10,000) dollars annually, for each of the fiscal years 1919 and 1920 from any moneys in the state treasury not otherwise appropriated.

SEC. 2. Said money shall be expended under the direction of the state rabies commission pursuant to the provisions of that certain act entitled "An act creating the state rabies commission; prescribing its membership and duties, and making an appropriation for the control and eradication of rabies and noxious animals within the State of Nevada, in cooperation with the biological survey of the United States Department of Agriculture," approved March 8, 1917, and in cooperation with the said biological survey of the United States Department of Agriculture.

VETO MESSAGE

EXECUTIVE DEPARTMENT,
CARSON CITY, NEVADA, April 1, 1919.

HON. GEORGE BRODIGAN, *Secretary of State, Carson City, Nevada.*

SIR: I am depositing with you, without my approval, Assembly Bill No. 156, entitled "An Act making an appropriation for the control and eradication of rabbits and ground squirrels within the State of Nevada, in cooperation with the Biological Survey of the United States Department of Agriculture."

This measure carries an appropriation of \$20,000.

The contract to be entered into between the United States Biological Survey and the Nevada Rabies Commission will include provision for the expenditure of the State in cooperation with the said Biological Survey a sum in excess of that provided for in the measure before me.

Respectfully submitted,

EMMET D. BOYLE,
Governor.

ASSEMBLY BILL No. 175

Introduced by Committee on Mines and Mining, February 28, 1919

AN ACT to amend an Act entitled "An Act creating the Nevada State Bureau of Mines and prescribing its duties," approved March 25, 1917.

The People of the State of Nevada, represented in Senate and Assembly, do enact as follows:

SECTION 1. Section 1 of the above-entitled act is hereby amended so as to read as follows:

Section 1. The Nevada state bureau of mines is hereby created. Said bureau shall consist of the governor, the inspector of mines, the director of the Mackay school of mines of the Nevada state university, and ten mining men who are actively engaged in mining, to be appointed by the governor, no two of whom shall be residents of the same county.

SEC. 2. Section 2 of the above-entitled act is hereby amended so as to read as follows:

Section 2. It shall be the duty of the Nevada state bureau of mines to make a study of the mineral resources of Nevada with especial reference to the mining of gold, silver, copper, lead, zinc and base metals, also reference to other economic products such as coal, oil, gas, cement materials and artesian waters.

To make a study of the different ores of Nevada with especial reference to conservation, concentration and reductions, reference to coal formation and statistics relative to and concerning mines and mining and mineral resources of the state and prepare for general distribution such information concerning the mineral resources of the state and for such publication and other means of dissemination and distributing such information as may, in the discretion of the said board, seem advisable.

SEC. 3. Section 3 of the above-entitled act is hereby amended so as to read as follows:

Section 3. Such publications required to be printed may in the discretion of said board be printed at the state printing office under the provisions of the act entitled "An act to designate and authorize the work to be done in the state printing office," approved March 5, 1909.

SEC. 4. Section 4 of the above-entitled act is hereby amended so as to read as follows:

Section 4. The bureau shall maintain its office in the city of Reno and is authorized under this act to provide itself with suitable rooms, furniture, stationery and all necessary things therefor. This commission shall meet not later than sixty days after the passage of this act for the purpose of organization and carrying out the provisions of this act.

The members of the aforesaid commission shall serve without compensation, but shall be reimbursed for actual expenses incurred in the performance of their official duties. The commission shall have general charge of the bureau and shall

elect a director to supervise efficiently the work of the bureau and to carry out the provisions of this act and upon his nomination such employees and assistants as the said commission may deem necessary and said commission shall also determine the compensation of all persons employed by the bureau.

SEC. 5. Section 5 of the above-entitled act is hereby amended so as to read as follows:

Section 5. The work of the bureau is to proceed upon a settled and orderly plan for the benefit of the public and investigators and developers in general, but individuals, firms and corporations may cooperate with the bureau to further its main purpose which is to increase the mineral production of Nevada, rather than to investigate matters of purely scientific interest.

SEC. 6. There shall be added to the bill two new sections to be known as sections 6 and 7:

Section 6. That the Nevada state bureau of mines is hereby authorized to enter into cooperation with any federal or state bureau for prosecution at joint expense of such work in Nevada as shall be deemed of mutual interest and advantage and under such conditions as said bureau deems for the best interest of the people of Nevada.

Section 7. The sum of twenty-five thousand (\$25,000) dollars for the year 1919 and twenty-five thousand (\$25,000) dollars for the year 1920 is hereby appropriated, out of any money in the general fund of the state treasury not otherwise appropriated, to carry out the provisions of this act.

VETO MESSAGE

EXECUTIVE DEPARTMENT,
CARSON CITY, NEVADA, April 1, 1919.

HON. GEORGE BRODIGAN, *Secretary of State, Carson City, Nevada.*

SIR: I am depositing with you, without my approval, Assembly Bill No. 175, entitled "An Act to amend an act entitled 'An Act creating the Nevada State Bureau of Mines and prescribing its duties,' approved March 25, 1917."

This bill carries with it an appropriation of \$50,000 for expenditure over the ensuing biennium.

The Act which this Act presumed to amend makes provision for the creation of a Bureau of Mines and provides a limited appropriation which may be expended, if, in the judgment of practical mining men whom I hope to consult, the State may, under an organized plan, embark on the work prescribed in the measure before me.

Bearing in mind the fact that we hope for the installation here of an experiment station under the direction of the Federal Bureau of Mines; that facilities are already provided for free ore and mineral determinations by the State Analytical Laboratory; that funds exist for the compilation of existing data in Nevada mining districts, and that limited facilities are available for the extension of technical service in new camps, it appears to me that we might with benefit start slowly

on an enterprise of unproven value by devoting the next two-year period to a survey of the situation under existing laws.

State investigation of districts and properties has been found here, while the State employed a mineralogist, and elsewhere to be often embarrassing rather than helpful to the prospector for obvious reasons. The matter requires a study which should precede the inauguration of so expensive an experiment in state aid to an industry.

Respectfully submitted,

EMMET D. BOYLE,
Governor.

ASSEMBLY SUBSTITUTE FOR ASSEMBLY BILL No. 195

Proposed by Committee on Education, March 5, 1919

AN ACT providing for the expenses of certain students of the University of Nevada or in any public high school in Nevada, or in any other educational institution in the State of Nevada approved by the State Board of Education, and making appropriation therefor.

The People of the State of Nevada, represented in Senate and Assembly, do enact as follows:

SECTION 1. Any person who enrolls at the University of Nevada or in any public high school in Nevada, or in any other educational institution in the State of Nevada approved by the state board of education for such purpose, as a regular or unclassified student, who shall have served at least six months in the army or navy of the United States during the war with Germany, and who has been honorably discharged or temporarily released from such service and who was a bona-fide resident of the State of Nevada for at least six months immediately prior to his induction into the services of the United States, may receive his expenses while attending such school as a student, as hereinafter provided.

SEC. 2. Any properly enrolled student claiming the benefits of this act will present to the president or principal of the school in which he is enrolled a certificate of his residence and service, as provided in section 1, from the county clerk of any county of the State of Nevada. Said certificate, when approved by the board of regents of the University of Nevada, the board of education or board of trustees of any public high school, or the state board of education for any school other than such university or public high school, will entitle the enrolled student to receive for his expenses one hundred twenty-five dollars (\$125) per university semester; *provided*, that no student shall receive more than two hundred fifty dollars (\$250) under the provisions of this act; *and provided further*, that should a student leave the educational institution before the completion of a semester he shall receive not

to exceed one dollar (\$1) per day for each and every day of every month he shall have been enrolled at the said institution.

SEC. 3. The governing boards, specified in section 2 of this act, are hereby authorized, empowered and directed to file with the state board of examiners a certified list of all enrolled students who have complied with the provisions of this act, accompanied by a claim setting forth the amount due for the use of each said student, as defined in section 2 of this act, whereupon the state controller is authorized and directed to draw his warrant in favor of said governing board for said amount and the state treasurer is authorized and directed to pay the same.

SEC. 4. To carry out the provisions of this act there is hereby appropriated, out of any money in the state treasury not otherwise appropriated, the sum of \$50,000 for the biennium. .

VETO MESSAGE

EXECUTIVE DEPARTMENT,
CARSON CITY, NEVADA, April 1, 1919.

HON. GEORGE BRODIGAN, *Secretary of State, Carson City, Nevada.*

SIR: I am depositing with you without my approval, Assembly Substitute for Assembly Bill 195, being an Act entitled "An Act providing for the expenses of certain students at the University of Nevada or in any public high school in Nevada, or in any other educational institution in the State of Nevada approved by the State Board of Education, and making an appropriation therefor."

This measure provides an appropriation of \$50,000 for the payment of certain expenses of tuition in the educational institutions of the State which may be incurred by students of such institutions who, after serving six months in the Army or Navy, may have been honorably discharged or temporarily released from the service.

It is with natural reluctance that I withhold approval of a measure which permits any practical expression of gratitude by the State for the service and sacrifice of any Nevada soldier or sailor—yet this bill is too palpably discriminating in its terms and benefits to be considered as fair to the great majority of the men who represented Nevada in the military and naval establishments during the war with Germany. Used to its full extent, it could provide but one year's schooling for two hundred out of the nearly six thousand men who joined the colors. The beneficiaries of the Act would be, I am sure, unhappily cognizant of the discrimination in their favor for which it provides, and the people, while applauding and anxious to reward the pluck and patriotism of the student who left his classroom to enlist or enter the service by other channels, would doubtless, on analysis, regret the fact that equal generosity could not have been shown to more than five thousand others, many of whom left homes, dependents and businesses to serve humanity, the Nation, and the State. It is doubtful if this discrimination could be practically rectified, even by succeeding Legislatures, at least by

measures providing for equal immediate monetary benefits, as may readily be determined by considering the ways and means to the raising through existing revenue machinery of a sum of money equal to a bounty of two hundred and fifty dollars for each Nevadan in the service.

Respectfully submitted,

EMMET D. BOYLE,
Governor.

ASSEMBLY BILL No. 216

Introduced by Mr. Marsh, February 28, 1919

AN ACT to provide for a state rifle range for the State of Nevada; to provide funds to meet the expenses of annual state rifle matches for the years 1919 and 1920; and creating authority for the control of state rifle matches and for the administration of the provisions of this Act.

The People of the State of Nevada, represented in Senate and Assembly, do enact as follows:

SECTION 1. The adjutant-general of the State of Nevada is hereby authorized, empowered and directed to proceed immediately upon approval of this act to arrange for the building of a state rifle range, including the purchase of necessary equipment and range supplies, and range installation, and for the operation and maintenance of said state rifle range.

SEC. 2. That the adjutant-general arrange in cooperation with the executive committee of a proposed Nevada association of rifle clubs for the holding of annual state rifle matches for the years 1919 and 1920 prior to the holding of the national rifle matches of said years; the expense thereof and necessary therefor to be met and paid from a fund hereafter created.

(a) The adjutant-general is hereby made the disbursing officer for all funds hereafter created in this act.

(b) All executive details in regard to the operation of said annual state rifle matches shall be acted upon and decided by an executive committee or board consisting of the adjutant-general as chairman, and the executive committee of the proposed Nevada association of rifle clubs.

(c) In the conduct of the actual matches herein provided for, national rifle association of America rules in regard to rifle matches with the United States small-arms firing manual shall govern.

SEC. 3. That the executive committee of the proposed Nevada association of rifle clubs designate the number of

members comprising a team from each rifle club in the State of Nevada, not to exceed six (6) in number from each club.

(a) This match shall be open to teams and individuals from the individual rifle clubs of Nevada, members of the Nevada association of rifle clubs. Members of which teams and individuals shall be in good standing, and individual clubs of which state association of rifle clubs shall be in good standing with said state association.

(b) For the purposes of economy in the conduct of said matches any available equipment in the custody of the adjutant-general shall be used.

(c) For a period of four days prior to the date set for the first match of the state competition, the various contesting rifle teams, members of rifle clubs within the State of Nevada and properly qualified members and individuals in such rifle clubs be extended the use of the state rifle range for practice purposes, subject to the rules of the Nevada state rifle association, and this period of practice be considered a part of the annual state rifle match period. The expenses incident to and necessary therefor shall be paid from the fund hereafter created.

(d) From the results of the various rifle matches by means of elimination, the personnel of the rifle team of the State of Nevada to represent the State of Nevada at the annual national rifle match be chosen and that the names of such persons chosen be presented to the governor of Nevada and suggested as his choice for the Nevada rifle team.

SEC. 4. That the adjutant-general of the State of Nevada, as chairman of the executive committee of the Nevada association of rifle clubs, shall have full authority to promulgate rules and regulations, not in conflict with rules of the national rifle association of America and the United States small-arms firing manual, to govern team and individual matches herein provided for; and shall also have authority to provide a suitable trophy and medals to be awarded to teams and individuals according to the by-laws which shall hereafter be adopted by the proposed Nevada association of rifle clubs.

SEC. 5. That the sum of six thousand (\$6,000) dollars is hereby appropriated from the general fund of the State of Nevada for the purposes above mentioned in sections 1, 2, 3, and of this act.

SEC. 6. That the adjutant-general, as disbursing officer herein provided, shall file in the office of the state controller vouchers for all expenditures made by him out of said appropriation; and the state controller, upon the order of the adjutant-general, shall draw warrants upon the state treasurer for such sums as are covered by vouchers filed as herein provided; and the state treasurer is hereby directed and shall pay said warrants.

VETO MESSAGE

EXECUTIVE DEPARTMENT,
CARSON CITY, NEVADA, March 30, 1919.

HON. GEORGE BRODIGAN, *Secretary of State, Carson City, Nevada.*

SIR: I am depositing with you, without my approval, Assembly Bill No. 216, entitled "An Act to provide for a state rifle range for the State of Nevada; to provide funds to meet the expenses of annual state rifle matches for the years 1919 and 1920; and creating authority for the control of state rifle matches and for the administration of the provisions of this Act."

This bill appropriates \$6,000 to carry out its purposes. There appears to be no legislation needed to permit rifle clubs to train and practice locally, the Government now supplying rifles, ammunition, and certain target equipment. Certainly no legislation is needed to permit the association of organized rifle clubs.

The measure before me provides funds for the erection of a state rifle range and for the payment of expenses incurred in attendance on state and national rifle matches.

Bearing in mind the fact that members of rifle clubs are in no sense obligated to any form of service other than that which the individual members may see fit to volunteer; that the major items of expense in each locality are met by federal appropriation; that the spirit of competition can be kept alive by interchange of records on local ranges in the same practical manner as was employed heretofore successfully by the Nevada militia when that organization was in existence, and that traveling expenses of those selected for the team to represent the State at the national matches are supplied by the Government, it might appear that a direct state appropriation for this object may be dispensed with at this particular time when a large construction program, unavoidable increases in the cost of essential departments, and a subnormal condition in the industries of the State all conspire to make difficult the problem of keeping taxes below the point where they become burdensome.

Respectfully submitted,

EMMET D. BOYLE,
Governor.

ASSEMBLY BILL No. 217

Introduced by Mr. Clayton, February 28, 1919

AN ACT to amend section 6 of an Act entitled "An Act relating to children who are now or may hereafter become dependent, neglected, or delinquent, to define these terms and to provide for the treatment, control, maintenance, protection, adoption, and guardianship of the person of such child or children," approved March 24, 1909, and further approved March 27, 1911, as amended by chapter 63, approved March 10, 1917.

The People of the State of Nevada, represented in Senate and Assembly, do enact as follows:

SECTION 1. Section 6 of the above-entitled act is hereby amended so as to read as follows:

Section 6. *Probation Officers.* The district courts in this state shall have authority to appoint any number of discreet persons of good moral character to serve as probation officers during the pleasure of the court; said probation officers shall receive no compensation from the county treasury except as herein provided. It shall be the duty of the clerk of the court, if practicable, to notify the said probation officer when any child is to be brought before the court; it shall be the duty of such probation officer to make investigation of such case; to be present in the court to represent the interests of the child when the case is heard; to furnish such court such information and assistance as the court or judge may require, and to take charge of any child before and after the trial as may be directed by the court.

The number of probation officers to receive compensation from the county, named and designated by the district court, shall be as follows:

The judge of the district court in and for each county, or city and county, of the state, or the judges where there are more than one judge of the said court, may appoint probation officers, in the number and under the conditions as in this act provided, whenever such appointments shall be deemed necessary to care for the dependent and delinquent children of the county; *provided*, such probation officers can be removed from office at any time by the said district judge, or judges.

The salary of said probation officers shall be as follows:

In counties having over fifteen thousand population, there shall be two probation officers receiving salaries, a man, who shall have jurisdiction and control over boys more than ten years old, and a woman, who shall have jurisdiction and control over boys ten years and under and over girls. It shall also be her additional duty to search out and assist all women requiring aid. The salaries of such probation officers shall be equal and shall be fixed by the court appointing them, at any sum not to exceed one hundred and fifty dollars and not less than one hundred dollars per month. The

expenses of each of such probation officers shall not exceed five hundred dollars per annum, for probation work.

In counties having less than fifteen thousand population it shall be within the discretion of the district judge, or judges, of each of said counties, to determine as to the necessity of appointing a probation officer; *provided*, that in counties having eight thousand and under fifteen thousand there shall be no more than one probation officer receiving a salary, and such salary shall be fixed by the court appointing him or her, in any sum not to exceed one hundred and twenty-five dollars per month; *provided, further*, that in counties of five thousand and under eight thousand population there shall be no more than one probation officer receiving a salary, and such salary shall be fixed by the court appointing him or her, in any sum not to exceed one hundred dollars per month; *and provided further*, that in counties under five thousand population there shall be no more than one probation officer receiving a salary, and such salary shall be fixed by the court appointing him or her, in any sum not to exceed seventy-five dollars per month.

All probation officers whose expenses are not herein provided shall be allowed such necessary incidental expenses as may be authorized by the judge, or judges, of the district court of said county; *provided*, that the said probation officer can be appointed for any portion or part of a year as the said district judge or judges may determine, and can be paid for the time and periods said probation officer serves under such appointment. The salary and expenses of the probation officer shall be paid out of the county funds in the county treasury in monthly installments, in the same manner as other claims against the county.

Any district judge, or judges, appointing such probation officers to receive a salary or other compensation from the county provided for under this act, shall transmit such appointment to the district superintendent of schools of the district of which the county in which said appointment is made is a part, the state superintendent of public instruction, and the governor of the state, who shall constitute a board to investigate the competency of such person so appointed to act as probation officer, and it shall be the duty of a majority of said board to approve or disapprove of such appointee, within thirty days after the submission thereof by the said district court, and a failure to act thereon within such time shall constitute an approval of such appointment. If a majority of such board are of the opinion that such appointee does not possess the qualifications for a probation officer, they shall notify the court of their conclusions within thirty days of such appointment to the respective members thereof, whereupon it shall be the duty of the district judge, or judges, to withdraw such appointment and appoint some one who shall receive the approval of the board.

Probation officers receiving salary or other compensation from the county, provided for by this act, are hereby vested

with the power and authority of police or sheriffs to make arrests and perform any other duties ordinarily required by policemen and sheriffs which may be incident to their office or necessary or convenient to the performance of their duties; *provided*, that other probation officers may be vested with like power and authority upon a written certificate from the district judge, or judges, that they are persons of discretion and good character; and that it is the desire of the court to vest them with all the power and authority conferred by law upon probation officers receiving compensation from the county.

The appointment of probation officers and approval thereof as to qualifications of such officers by the board herein designated, shall be filed in the office of the clerk of the court. Probation officers shall take an oath such as may be required of other county officers to perform their duties, and file it in the office of the clerk of the district court.

VETO MESSAGE

EXECUTIVE DEPARTMENT,
CARSON CITY, NEVADA, April 1, 1919.

HON. GEORGE BRODIGAN, *Secretary of State, Carson City, Nevada.*

SIR: I am depositing with you, without my approval, Assembly Bill No. 217, entitled "An Act to amend section 6 of an Act entitled 'An Act relating to children who are now or may hereafter become dependent, neglected, or delinquent, to define these terms and to provide for the treatment, control, maintenance, protection, adoption and guardianship of the person of such child or children,' approved March 24, 1909, and further approved March 27, 1911, as amended by chapter 63, approved March 10, 1917."

This Act presumes to compel in one county in this State only the appointment of two probation officers—one of whom shall be a man, the other a woman.

Affecting, as it does, only Washoe County, it was not introduced by the Washoe Delegation or by any member thereof and appears to take discretionary powers now vested in the officers of that county from them.

Existing law will permit in the discretion of the local officers substantially the doing of the things contemplated in the Act before me.

Respectfully submitted,

EMMET D. BOYLE,
Governor.

ASSEMBLY BILL No. 242

Introduced by Mr. Chandler, February 28, 1919

AN ACT making it a felony for any sheepherder in charge of a herd of sheep to abandon such herd on the range, and prescribing a penalty therefor.

The People of the State of Nevada, represented in Senate and Assembly, do enact as follows:

SECTION 1. Any sheepherder, or person employed to herd sheep, being actually in charge of a herd or flock of sheep on uninclosed lands or the public range in this state, who shall wilfully abandon said sheep on such uninclosed lands or range without leaving some person of suitable age and discretion in charge of such herd or flock, shall be guilty of a misdemeanor, and on conviction thereof shall be punished by imprisonment in the county jail for a period of not more than six months.

VETO MESSAGE

EXECUTIVE DEPARTMENT,
CARSON CITY, NEVADA, April 1, 1919.

HON. GEORGE BRODIGAN, *Secretary of State, Carson City, Nevada.*

SIR: I am depositing with you, without my approval, Assembly Bill No. 242, entitled "An Act making it a felony for any sheepherder in charge of a herd of sheep to abandon such herd on the range, and prescribing a penalty therefor."

The title to this Act is not in accord with its substance, the former "making it a felony" to do certain things, the latter a misdemeanor for doing the same thing.

The further objection may be urged against it that it is too general in its provisions and might open the door to abuses greater than those which it is aimed to guarantee against.

It seems to me that great caution should be exercised in the drafting of laws patterned after the obsolete Acts of a century or two ago which made penal offenses of commercial derelictions of duty. A measure designed to do what this Act proposes containing reasonable safeguards of the rights of the sheepherder might find approval from me.

Respectfully submitted,

EMMET D. BOYLE,
Governor.

ASSEMBLY BILL No. 250

Introduced by Mr. Lockhart, February 28, 1919

AN ACT to amend an Act entitled "An Act to regulate proceedings in criminal cases in this State and to repeal all other Acts in relation thereto," approved March 17, 1911, as amended March 24, 1913, as amended March 17, 1915.

The People of the State of Nevada, represented in Senate and Assembly, do enact as follows:

SECTION 1. Section 410 of the above-entitled act, being section 7260, Revised Laws, 1912, shall be amended to read as follows:

Section 410. Whenever any person shall be convicted of any felony for which no fixed period of confinement is imposed by law, the court imposing the sentence shall not fix a definite term of imprisonment, but shall fix and establish, in its discretion, a minimum and maximum term for which such person shall be confined in the state prison; *provided*, that the minimum term so fixed and established by the court shall not be less than the shortest term fixed by law for the punishment of the offense of which he was convicted, and the maximum term so fixed and established by the court shall not be greater than the longest term fixed by law for the punishment of the offense of which he was convicted. Where no minimum term of imprisonment is prescribed by law, the court shall fix the minimum term in its discretion at not less than one year nor more than five years, and where no maximum term of imprisonment is prescribed by law, the court shall fix such maximum term of imprisonment. Immediately after the rendition of judgment in each case, the district judge who presided at the trial and the district attorney who prosecuted the case shall transmit to the board of parole commissioners a written statement of facts within their knowledge concerning such case.

VETO MESSAGE

EXECUTIVE DEPARTMENT,
CARSON CITY, NEVADA, April 1, 1919.

HON. GEORGE BRODIGAN, *Secretary of State, Carson City, Nevada.*

SIR: I am depositing with you, without my approval, Assembly Bill No. 250, entitled "An Act to amend an Act entitled 'An Act to regulate proceedings in criminal cases in this State, and to repeal all other Acts in relation thereto,' approved March 17, 1911, as amended March 24, 1913, as amended March 17, 1915."

This Act presumes to permit an expression by trial judges in criminal cases of the maximum sentence to be imposed under the indeterminate-sentence law, its author having in mind, no doubt, the idea that the Board of Parole Commissioners might thereby secure

an expression regarding the Judge's opinion relative to the extent of the punishment which should be meted out to each offender.

Few men are, under the existing law, required to serve a maximum sentence, and courts are afforded full facilities for the expression of opinion for the consideration of the parole board.

The existing law permits the holding of men under observation and under certain desirable control on parole for a period within the prescribed limit. I see disadvantages with no practical commensurate benefit from the measure before me.

Respectfully submitted,

EMMET D. BOYLE,
Governor.

ASSEMBLY BILL No. 254

Introduced by Mr. Chandler, February 28, 1919

AN ACT to amend section 3 of an Act entitled "An Act to provide for obtaining correct statements of the financial condition of the several counties in this State, and other matters of statistical information," approved February 26, 1873, said section being section 1586, Revised Laws of Nevada, 1912.

The People of the State of Nevada, represented in Senate and Assembly, do enact as follows:

SECTION 1. Section 3 of the act specified in the title hereof is hereby amended to read as follows:

Section 3. It shall be the duty of each county assessor, at the time he delivers to the clerk of the board of equalization his assessment roll for the year in which general elections are held, to deliver also a written report, embracing said year and the preceding year, to the county auditor, of the following matters within his county:

First—The number of acres in agriculture, and the approximate amount of agricultural, grazing and timber lands.

Second—The number of horses, mules, jacks, jennies, cattle, sheep, goats, and swine.

Third—The aggregate quantity of wheat, rye, maize, potatoes, grapes, and other agricultural products.

Fourth—A statement of the approximate quantity of mineral lands in such county, and the approximate quality and value of such.

Fifth—The number of mills, manufactories, distilleries, and breweries, classifying each, and the number and length of all flumes and water ditches used to convey water for mining, manufacturing, or agricultural purposes.

Sixth—The number of transplanted fish, their variety, by whom transplanted, and into what stream or lake.

Seventh—The number and kind of forest, fruit, or nut trees transplanted, and under successful cultivation.

Eighth—He shall also report such other matters as may be required by the annual circular of the surveyor-general.

Until the delivery of the report required by this section, the salary of said county assessor for the preceding month, and for such subsequent period as such report shall remain undelivered, shall be withheld from him.

VETO MESSAGE

EXECUTIVE DEPARTMENT,
CARSON CITY, NEVADA, April 1, 1919.

HON. GEORGE BRODIGAN, *Secretary of State, Carson City, Nevada.*

SIR: I am depositing with you, without my approval, Assembly Bill No. 254, entitled "An Act to amend section 3 of an Act entitled 'An Act to provide for obtaining correct statements of the financial condition of the several counties in this State, and other matters of statistical information,' approved February 26, 1873, said section being section 1586, Revised Laws of Nevada, 1912."

This measure aims to compel the submission at a stated time of statistical data by County Assessors under an obsolete and unworkable statute.

It seems to me that the author of this measure was seeking an outlet for his sense of humor in submitting it. Experience has shown that the Assessor is not in a position to secure and report the heterogeneous hodge-podge of statistics called for in this Act and that he does not do so—even though his labors may be lightened henceforth by the removal of the practical necessity of reporting the number of "breweries and distilleries" in his jurisdiction.

The data aimed to be secured under the Act of which this is presumed to be amendatory is submitted, as far as it is practicable to submit it, in the classification of property reports to the State Board of Equalization.

Respectfully submitted,

EMMET D. BOYLE,
Governor.

ASSEMBLY BILL No. 279

Introduced by Mr. Hill, March 14, 1919

AN ACT to establish a standard for gasoline, and providing a penaty for the violation of said Act.

The People of the State of Nevada, represented in Senate and Assembly, do enact as follows:

SECTION 1. It shall be unlawful for any manufacturer, dealer or vender to sell or offer for sale any petroleum product known as gasoline that has a specific gravity of less

than sixty degrees as measured by the Beaume hydrometer at a temperature of sixty degrees Fahrenheit; and each manufacturer, dealer or vender of gasoline shall brand or label every cask, barrel or car containing such products with figures denoting the specific gravity and the word "gasoline" in large plain letters at least one and one-half inches in size.

SEC. 2. Any person, corporation or company who shall offer for sale any gasoline contrary to the provisions of this act or shall be in possession or control of any gasoline held for sale, not labeled as provided in section one of this act, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine of not more than five hundred dollars, or be sentenced to the county jail for a period not exceeding six months; and in addition to said fine or punishment said gasoline shall be condemned and destroyed by order of the court having jurisdiction of the offense.

SEC. 3. It shall be the duty of the department of weights and measures of the University of Nevada to enforce the provisions of this act.

VETO MESSAGE

EXECUTIVE DEPARTMENT,
CARSON CITY, NEVADA, April 1, 1919.

HON. GEORGE BRODIGAN, *Secretary of State, Carson City, Nevada.*

SIR: I am depositing with you, without my approval, Assembly Bill No. 279, entitled "An Act to establish a standard for gasoline, and providing a penalty for the violation of said Act."

This bill, if it became a law, would make it unlawful to sell any petroleum product as gasoline of less than sixty degrees gravity as measured by the Beaume hydrometer. Gasoline of this high gravity may be secured, but only at substantial advance in the price over that charged for the commercial gasoline manufactured and sold generally for motor-vehicle use. Moreover, the Beaume test is not the measure of the quality of fuel oils. The standard specifications of the Government do not refer to it, and, excepting in a general way, it is not an index to the heat content, the power-producing qualities, the volatility, or the general operating characteristics of liquid fuel.

My approval of the measure is withheld because it presumes to set up an unscientific standard, and, in particular, because it would compel an increase in the cost of gasoline to Nevada consumers of from 6 to 8 cents per gallon above existing prices, while insuring no increase in the efficiency of such fuel, excepting, perhaps, easier starting in extreme cold weather.

Respectfully submitted,

EMMET D. BOYLE,
Governor.





STATE OF NEVADA

RULES FOR

Overhead and Underground Lines

FOR

ELECTRIC UTILITIES

PRESCRIBED BY THE

Public Service Commission of Nevada



CARSON CITY, NEVADA

STATE PRINTING OFFICE

: : : :

JOE FARNSWORTH, SUPERINTENDENT

1920



LETTER OF TRANSMITTAL

RENO, NEVADA, April 30, 1920.

Public Service Commission, State of Nevada, Carson City, Nevada.

GENTLEMEN: At a hearing of the Public Service Commission of Nevada, held in Reno, February 27, 1920, Commissioner J. G. Scrugham presiding, and at which meeting were present representatives of the various utilities of the State, concerned in the construction, operation, and maintenance of overhead and underground wire systems, the matter of drafting and adopting rules governing such practices for the State of Nevada was discussed. It was the sense of the Commission and representatives of wire-using utilities at this hearing that standards be formulated and rules adopted which would be issued by the Commission as an order.

To this end a committee was appointed by Commissioner Scrugham to formulate standards and draft recommendations for rules to be submitted to the Commission as a basis for an order. The committee appointed was as follows:

- Mr. F. O. BROLLI, Engineer—Representing the Public Service Commission of Nevada.
- Mr. E. D. BROWN, Superintendent Truckee River General Electric Company, and Mr. H. SHIELDS, Superintendent Nevada Valleys Power Company—Representing the Electrical Power Utilities of Nevada.
- Mr. GEO. I. JAMES and Mr. PAUL KLEIN—Representing the Labor Interests of Nevada.
- Mr. R. W. MASTICK, Transmission and Protection Engineer, Bell Telephone Company of Nevada—Representing the Signal Utilities of Nevada.

Since this appointment your committee has been carefully considering and working upon recommendations for a code of standards and rules to meet Nevada conditions which should be reasonable and adequate to provide standards for the construction, operation, and maintenance of overhead and underground line systems from the standpoint of public safety and good service. We have prepared and submit herewith for your consideration a draft of "Rules for Overhead and Underground Lines" upon which the committee, after consideration of available material, agrees unanimously.

In the preparation of these recommendations for rules your committee has been largely governed in the matter of construction practices by the work and publications of the United States Bureau of Standards. The National Electrical Safety Code, Part 2, as revised to November, 1919, has been used as a basis, and the rules submitted herewith are patterned after and in conformity with that publication.

In the matter of rules governing the construction, operation, and maintenance of overhead supply and signal lines involved in paral-

leism your committee has been largely governed by the final report of the Joint Committee on Inductive Interference to the Railroad Commission of the State of California. This report, in the opinion of your committee, represents the most authoritative and comprehensive work published on the matter of inductive interference, and provides practices which are both reasonable and adequate from the standpoint of public safety and good service.

In using the two above-mentioned sources of information for guidance in the preparation of the recommendations submitted herewith, it should be understood, and your committee desires to make plain, that it also gave very careful consideration to other sources of information, such as orders of various other state commissions and state laws governing these matters, together with such practices as experience and tests have shown to be desirable. In a great many instances practices derived from these sources have been embodied in the recommended rules for Nevada.

In conclusion, your committee expresses the hope that its recommendations as submitted will be adopted by the Commission and issued as an order without material change. Your committee also takes this opportunity of thanking the Commission for its appointment and of expressing its appreciation for confidence reposed in it.

Respectfully submitted,

COMMITTEE ON RULES FOR OVERHEAD AND
UNDERGROUND LINES.

F. O. BROILL, *Chairman*,
E. D. BROWN,
H. SHIELDS,
PAUL KLEIN,
R. W. MASTICK,
GEO. I. JAMES.

Approved July 24, 1920:

PUBLIC SERVICE COMMISSION OF NEVADA.

S. G. COLCORD, *Acting Secretary*.

RULES FOR OVERHEAD AND UNDERGROUND LINES

**Prepared and Submitted by a Joint Engineering Committee
Representing the Public Service Commission, Power,
Signal, and Labor Interests for Adoption by
the Public Service Commission of
the State of Nevada**

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RULES FOR OVERHEAD AND UNDERGROUND LINES

SECTION I

GENERAL

101—Definitions.

For the purpose of these rules the following definitions apply:

Supply Circuit—A circuit used for transmitting a supply of electrical energy.

Railway Signal Circuits above 400 volts to ground are always supply circuits within the meaning of these rules and below 400 volts may be classed as supply circuits, if so run and operated throughout.

Signal Circuit—A circuit for signal or communication service and devoted exclusively to the transmission of signals or intelligence, which operates at not exceeding 400 volts to ground or 750 volts between any two points of the circuit and the transmitted power of which does not exceed 150 watts. Below 150 volts no limit is placed on the capacity of the system. Private circuits of this character, which are exposed to supply circuits of over 5,000 volts between any two conductors or 2,900 volts between any conductor and ground and are owned and operated by a supply or other company incidental to its business and to which the public does not have access, shall be classed as supply circuits of between 5,000 volts and 7,500 volts where involved in crossings and conflicts.

Line—A circuit or aggregation of circuits using the same supporting or containing structures, together with the supporting or containing structures.

Conflicting or in Conflict (See Figure 1)—Where one line is so situated with respect to a second line (except at crossings) that the overturning of the first line will result in contact between its poles or conductors and the conductors of the second line, assuming that no conductors are broken in either line; provided, however, that lines on opposite sides of a highway, street, or alley are not considered as conflicting if separated by a distance not less than 60 per cent of the height of the taller pole line, but in no case less than 20 feet.

Crossing—A situation where circuits of one line cross over circuits of another line.

Joint Use—A situation where supply circuits and signal circuits are carried on the same poles.

Parallel—A situation where a supply circuit and a signal circuit follow substantially the same course or are otherwise in proximity for a sufficient distance, so that the supply circuit is liable to create inductive interference in the signal circuit.

Grade A, Grade B, Grade C, Grade D, and Grade E—Terms used to designate five grades of construction. Wherever the requirements for the five grades differ, the requirements for each are stated separately in the rules covering those requirements.

Apparent Sag—The departure of the wire in a given span from the straight line between the two points of support of the span, at 60°F. with no wind loading.

Normal Sag—The difference in elevation between the highest point of support of a span and the lowest point of the conductor in the span, at 60°F. with no wind loading.

Voltage or Volts—The highest effective voltage between the conductors of the circuit concerned, except that in grounded multiwire circuits not exceeding 750 volts between outer conductors it means the highest effective voltage between any wire of the circuit and the ground.

When one circuit is directly connected to another circuit of higher voltage (as in the case of an autotransformer) both are considered as of the higher voltage (unless the circuit of lower voltage is permanently grounded). Direct connection implies electrical connection as distinguished from connection merely through electromagnetic or electrostatic induction.

Transposition—An interchange of positions of the conductors of a circuit.

Barrel—An arrangement of a section of supply circuit of uniform configuration within which each conductor occupies each of the conductor positions for such distances as will result in a maximum degree of balance.

Configuration—Means the geometrical arrangement of a circuit or circuits, including the size of the wires, and their relative positions with respect to one another and earth.

Discontinuity—Means an abrupt change in the relative positions of a supply and a signal circuit, or any abrupt change in configuration, line impedance, or load along either such circuit (including such changes due to connected circuits, transformers, cables, loading coils, or other apparatus) which materially affects the magnitude or phase of the induced voltages or currents per unit length or the capacitances of either circuit. Transpositions, however, are not considered to be discontinuities.

Coordination—As applied to transposition systems, means that the transpositions in supply and signal circuits involved in a parallel are efficiently located, with respect to each other and to the discontinuities, for reducing the inductive effects on the signal circuits.

Balanced and Residual Voltages—The voltages to ground of the several wires of a supply circuit are divided for convenience into two classes of components—"Balanced" and "Residual."

The "Balanced Voltages" are those components which are equal in magnitude and have such phase relations that their algebraic sum is zero at every instant.

The remaining components of the voltage to ground, which exist under conditions other than perfect balance, are termed "Residual."

Balanced and Residual Currents—The currents in the several wires of a supply circuit are divided for convenience into two classes of components—"Balanced" and "Residual."

The "Balanced Currents" are those wholly confined to the wires of the circuit and hence their algebraic sum is zero at every instant.

The remaining components of the currents in the several wires, which exist under conditions other than perfect balance, are termed "Residual."

Urban Districts—Means thickly settled communities (whether in cities or suburbs) where congested traffic occurs. A highway, even though in the country, on which traffic is often very heavy, is considered as urban.

Rural Districts—Means all places not urban, usually in the country, but in some cases within city limits.

Wire Gages—The American Wire Gage (A.W.G.), otherwise known as Brown and Sharpe (B.&S.), is the standard gage for copper, aluminum and other conductors, excepting steel, for which Steel Wire Gage (Stl.W.G.) is used throughout these rules.

102—*Scope.*

These rules shall be observed in the construction, reconstruction, maintenance and operation of supply lines and signal lines in overhead and underground construction, whether operated in connection with public utilities privately or municipally owned, industrial establishments, or otherwise.

These rules are not intended as complete specifications for overhead and underground line construction and operation, but are intended to embody the requirements which are most important from the standpoint of safety and good service.

Construction should be made according to accepted good practice for the given local conditions in all particulars not specified in the rules.

103—*Application.*

For convenience these rules have been arranged into several sections within which the specific requirements peculiar to the situations involved have been set forth. The requirements for each section shall apply to the situations covered within the limits set forth.

Section I—General. The requirements of this section apply to the rules as a whole and include definitions of terms which are used in a special or restricted sense.

Section II—General Rules for Pole and Tower Lines. The requirements of this section apply to all supply and signal pole and tower lines whether or not they are involved in situations requiring the definite grades of construction provided in Section V or Section IX.

Section III—Clearances and Separations. The requirements of this section apply to all classes of lines alone or involved in crossings, conflicts or joint use of poles, and provide minimum clearances between conductors of the same or different classes and separations between conductors and their supports or other structures. Minimum clearances above roadways, at road or street crossings and railroad crossings, are also provided.

Section IV—Classification of Circuits According to the Grade of Construction Required. This section classifies supply circuits according to voltage and specifies the grade of construction required for particular situations such as crossings, conflicts, and joint use of poles. It also classifies signal lines as to the grade of construction required with particular respect to crossings over railways.

Section V—*Specification for Strength and Other Requirements for Supply Lines of Grades A, B, and C.* The requirements of this section apply only to supply lines and define the three grades of construction A, B, and C for heavy-, medium-, and light-loading conditions.

Sections II to V inclusive are *general* in nature and the requirements of any one or all of these sections may be referred to and will be governing in the specific situations outlined in Sections VI to X following.

Section VI—*Requirements for Supply Lines Including Electric Railway Feeders.* The requirements of this section apply to supply lines alone or where involved with other supply lines at crossings, conflicts, or joint use of poles.

Section VII—*Crossing of Supply Lines over Railways.* The requirements of this section apply specifically to the crossing of supply lines over railways. In the situation covered the requirements are restricted to the crossing span and the wires of the next adjoining spans.

Section VIII—*Crossings, Conflicts, and Joint Use of Poles, Supply Lines and Signal Lines.* The requirements of this section apply to the following situations within the limits set forth:

(a) *At Crossings*—The crossing span and the wires of the next adjoining spans.

(b) *At Conflicts*—The line throughout the conflicting section.

(c) *Joint Use*—The line throughout the jointly used section.

Section IX—*Signal Lines at Crossings and Used Alone.* The requirements of this section apply to signal lines alone or involved in crossings and conflicts with supply lines. Specifications for signal line construction of grades D and E are included.

Section X—*Underground Lines.* The requirements of this section apply to supply and signal lines in underground systems.

The requirements of Sections II to X inclusive are derived from and are in conformity with Part 2 of the National Electrical Safety Code of the United States Bureau of Standards.

Section XI—*Inductive Interference Measures.* The requirements of this section govern the construction and operation of supply and signal lines generally for the prevention or mitigation of inductive interference, and apply particularly to cases involving parallelism.

The requirements of Section XI are derived from the rules recommended by the Joint Committee on Inductive Interference to the Railroad Commission of the State of California and on rules established by various other commissions as the result of experience and tests.

In the appendices listed below are given loading data, mechanical characteristics, normal sags for overhead line conductors, transverse strength requirements for overhead line supports, typical examples of construction methods, clearances, etc., covered by the rules, and a loading map of the State of Nevada. Aside from the loading map, these appendices are derived from and are in conformity with Part 2, Appendices A and B, of the National Electrical Safety Code of the United States Bureau of Standards. The loading map is based upon

statistics and reports furnished by the United States Weather Bureau for the State of Nevada.

Appendix A—*Loading Data, Mechanical Characteristics, and Normal Sags of Overhead Line Conductors.*

Appendix B—*Loading Data, Mechanical Characteristics, and Recommended Transverse Strength of Overhead Line Supports.*

Appendix C—*Typical Examples of Construction Methods, Clearances, etc.*

Appendix D—*Loading Map of the State of Nevada.*

104—*Minimum Requirements.*

The requirements of these rules as to spacings, clearances and strength of construction are minimum requirements. More ample spacings and clearances or greater strength of construction may be provided if other requirements are not neglected in so doing.

105—*Avoidance of Crossings, Conflicts, and Parallels.*

Every reasonable effort shall be made to avoid creating crossings, conflicts and parallels. If the parties concerned can agree upon a plan for providing an adequate separation of the two classes of lines so as to avoid these conditions, such plan shall be put into effect. In no case shall a crossing, conflict, or parallel be created unless the cost of avoidance is greater than the cost of remedial measures.

In the case of constant potential alternating-current supply circuits not exceeding 5,000 volts between conductors or 2,900 volts to ground; constant-current circuits not exceeding 7.5 amperes, or direct-current grounded trolley circuits not exceeding 750 volts and signal lines, the joint use of poles is preferable to conflicting pole lines.

In the location and construction of the first line along a public highway, special effort must be made to avoid crossing the highway. If the first line crosses from one side of the highway to the other, complications in the transposition scheme and crossings or conflicts will result if another line is constructed along the same highway.

106—*Cooperation.*

Any party contemplating the construction of a new supply or signal line, which involves the creation of a conflict or parallel with an existing line of the other type, or generally to reconstruct or change the operating conditions of an existing line involved in any such conflict or parallel, shall confer with the other party or parties concerned, and they shall cooperate with a view of avoiding such conflict or parallel, or, if such avoidance be impracticable, they shall cooperate in applying the measures provided in these rules for minimizing the hazard or interference created thereby.

107—*Principle of Least Cost.*

When there are two or more different practicable methods of avoiding or mitigating hazard or interference the method which involves the least cost shall in general be adopted irrespective of whether the necessary changes are made in the plant of the party creating the crossing, conflict or parallel or in the plant of the other party; provided, however, that preference shall be given to methods of avoiding crossings, conflicts or parallels over methods of mitigating hazard or interference; and provided further, that as between different methods of mitigation having different degrees of effectiveness, the most effective

method, the cost of which can be justified, shall be adopted. In estimating such costs, all factors of expense to both parties shall be taken into account.

108—*Division of Costs.*

The costs incurred in applying these rules shall, in general, be divided in accordance with the following principles:

- (a) All plant changes in so far as they represent a net addition to capital, shall be paid for by the party whose plant is changed.
- (b) All costs of a continuing nature, such as those occasioned by the general operating and maintenance requirements, shall be paid by the party whose plant is so operated and maintained.
- (c) Except as otherwise provided in (a) and (b) all costs for remedial or preventive measures occasioned by a specific crossing, conflict or parallel hereafter created or proposed, including the costs of removing or relocating lines or equipment and any other such costs normally chargeable to operating expense or depreciation reserve, shall be paid by the party creating or proposing to create such crossing, conflict, or parallel.
- (d) In case where for a special reason the foregoing principles as to division of costs are not considered properly applicable, the parties concerned may, by agreement, divide the costs in other proportions.

109—*Existing Construction.*

Parties operating supply or signal lines shall exercise due diligence in applying measures in accordance with the principles of these rules, for mitigating hazards or inductive interference due to existing crossings, conflicts, or parallels. Any such crossings, conflicts, or parallels, which now or hereafter cause excessive hazard or interference, shall be attended to promptly.

When lines involved in existing crossings, conflicts or parallels are added to, extended or generally reconstructed, or when additional apparatus is connected to such lines, or when apparatus now connected to such lines is renewed or rearranged, the new or changed part of the plant shall thereafter conform to the provisions of these rules.

110—*Saving Clause.*

Any party desiring to make a departure from these rules regarding the operation or reconstruction of lines now existing, or believing that these rules work an injustice or an undue hardship, may file a written petition with the Public Service Commission, whereupon the Commission will take such action as may seem to it proper.

The Commission reserves the right to modify any of the provisions of these rules in any specific case or otherwise when, in the Commission's opinion, public interest would be better served by so doing.

111—*Information for Commission.*

Parties operating supply or signal lines subject to the jurisdiction of this Commission, involved in or which may become involved in a crossing, conflict, or parallel, shall file with the Commission, as the Commission may require, information appertaining to measures for the prevention or mitigation of hazards or inductive interference agreed upon between said parties.

112—Reference to Commission.

If in any case the parties at interest shall fail to agree upon any question relating to the interpretation or the application of these rules, the matter shall be referred to this Commission.

SECTION II**GENERAL RULES FOR POLE AND TOWER LINES****201—Compliance with Other Rules and Special Precautions.**

(a) *Other Rules.* The additional requirements for supply lines in those situations which are required to have a definite grade of construction, A, B, or C, will be found in Sections VI, VII, and VIII. The additional requirements for signal lines which are required to have a definite grade of construction, D and E, will be found in Section IX. Rules 202, 203, and 204 of this section also apply to signal lines.

(b) *Special Precautions.* Where conductors are attached to structures other than those used solely or principally for supporting lines, all rules shall be complied with in so far as they apply, and such additional precautions as may be necessary shall be taken to avoid injury to such structures or to the persons using them. The supporting of conductors on trees and roof tops should, in general, be avoided.

202—Location of Poles and Towers.

(a) *Clearance from Hydrants* (See Figure 2). Poles, towers, and other supporting structures and their guys and braces shall be so located, when practicable, as to provide horizontal clearances from them to the nearest point of hydrants and signal pedestals of not less than 4 feet and to curb lines (unless poles are suitably protected from traffic) of not less than 6 inches.

(b) *Near Street Corners* (See Figure 2). Where hydrants are located at street corners, poles should not be set so far from them or from the corners as to make necessary the use of flying taps inaccessible from the poles. (See Rules 206a and 211b.)

(c) *Guards.* Where necessary, poles and towers exposed by traffic to abrasion or other damage which would materially affect the strength of the support, shall be protected by guards.

(d) *Clearance from Rail* (See Figure 2). Where railway tracks are paralleled by overhead lines, the poles shall, if practicable, be located not less than 12 feet from the nearest track rail.

Supports for overhead trolley-contact conductors may be located as near their own track rail as conditions require. If very close, however, permanent screens on cars will be necessary to protect passengers.

(e) *Rubbish.* Poles and towers shall be so placed, guarded, and maintained as to be exposed as little as practicable to brush, grass, rubbish, or building fires.

203—Guys and Anchors.

(a) *When Required* (See Figure 3). When the mechanical loads to be imposed on poles, towers or other supporting structures are greater than can be safely supported by the poles or towers alone, additional strength shall be provided by the use of guys, braces, or other suitable construction.

(b) *Angles and Dead Ends* (See Figure 4). Guys should also, when necessary, be used wherever conductor stresses are not balanced, as at corners, angles, dead ends, and changes of grade of construction. This is to prevent undue increase of sags in adjacent spans as well as to provide sufficient strength for those supports on which the stresses are considerably unbalanced.

(c) *Guys Take Total Load*—When guys are used with poles or towers capable of considerable deflection before failure, they shall be able to support the entire stress in the direction in which they act, the pole acting simply as a strut. The guy should be attached to the structure as near as practicable to the center of the conductor load to be sustained.

(d) *Guy Fastenings* (See Figure 5). Guy wires should be stranded and where attached to anchor rods should be protected by suitable guy thimbles. Cedar and other soft-wood poles to which any guy having a strength of 5,000 pounds or more is attached should be protected by the use of suitable guy shims, and in this case guy hooks, lag bolts, or other suitable means should be provided to prevent the guys from slipping along the poles. Guy hooks should also be used wherever the horizontal distance from anchor to pole is less than two-thirds the vertical height of the guy attachment to the pole above the anchor.

(e) *Guy Insulation*. Guys attached to metal poles or structures should be insulated from them by suitable blocking, when liable to be subject to electrolysis of the anchors, unless insulators are placed in the guys themselves.

204—*Insulators or Mechanical Guards for Guy and Span Wires.*

(a) *Where Required* (See Figure 6). Except as noted below, each guy wire or guy cable attached to any pole or structure carrying conductors of above 300 volts to ground, and not exceeding 15,000 volts, or where exposed to such voltage by other lines, shall be equipped with an effective insulator located not less than 8 feet above the ground, but not nearer than 5 feet to any conductor over 300 volts to ground, and at such a point that if the guy wire breaks at or below the insulator, or a supply conductor falls upon it, the part above the insulator cannot be reached from the ground.

(b) *Two Insulators* (See Figure 8). When the guy wire to any pole, carrying supply or signal conductors, or both, is carried above or under overhead supply conductors of above 300 volts to ground, two or more insulators shall, where hazard would otherwise exist, be used so that so far as possible the exposed section of the guy wire shall be between two insulators. Neither insulator shall be within 8 feet from the ground.

(c) *Grounding of Guy* (See Figure 7). The anchored end of the guy wires attached to wood poles carrying lines above 15,000 volts shall be permanently grounded wherever this part of the guy has a clearance of less than 8 feet to ground, unless an insulator is used, which is permanently effective against the highest voltage, which is liable to be impressed upon it.

(d) *Location of Insulators*. Where guys in which it is necessary to install insulators are so arranged that one crosses or is above another,

insulators shall be so placed that in case any guy sags down upon another, the insulators will not become ineffective.

(e) *Strength*. Guy insulators shall have a mechanical strength at least equal to that of the guys in which they are installed.

(f) *Exceptions*. The placing of an insulator in a guy wire or guy cable will not be required where the guy wire or guy cable is electrically connected to grounded steel structures or to a ground connection on wooden poles. Where guys are uniformly permanently grounded throughout any system of overhead lines, strain insulators will not be required.

(g) *Span Wire Insulators* (See Figure 9). All span wires, including bracket span wires, shall have suitable insulators (in addition to an insulated hanger, if used) inserted between each point of support of the span wire and the trolley-contact conductor supported. One such insulator shall be not nearer than 4 feet from the point of support of the span wire and the other not nearer than 4 feet from the trolley-contact conductor. This rule does not apply to insulated feeder taps used also as span wires.

Span wires supporting constant-current lamp fixtures shall have a suitable insulator inserted between each point of support of the span wire and the lighting fixture; the insulators shall not be nearer than 4 feet from the point of support of the span wires. (See Figure 10.)

(h) *Insulators in Suspension Ropes* (See Figure 12). Effective insulators should be inserted at least 8 feet from the ground in metallic suspension ropes or chains supporting lighting units of series circuits.

(i) *Mechanical Guards*. The ground end of all guy wires or cables attached to ground anchors exposed to traffic shall be provided with a substantial and conspicuous wood or metal guard not less than 8 feet long.

It is recommended that in exposed or poorly lighted locations such guards be painted white or some other conspicuous color.

205—Transformers, Regulators, Lightning Arresters, Switches, and Similar Equipment on Supply Lines.

(a) *Location on Pole* (See Figures 11 and 12). Transformers, regulators, lightning arresters, and switches, when located below conductors or other attachments, shall be maintained on that side of the pole opposite to the climbing side.

On buckarm poles the climbing space and the lateral working spaces parallel to either the line arms or the buckarms shall be kept clear, if practicable.

Constant-current lamp fixtures should not be located on poles supporting transformers.

(b) *Guarding* (See Figures 24 and 25). Current-carrying parts of switches, automatic circuit-breakers and lightning arresters, if exceeding 300 volts to the ground, and located on the climbing side of the pole, shall be inclosed or suitably guarded, if less than 20 inches from the pole center, except when located on or above the top crossarm. The spacing between transformers and similar equipment of the supply lines, and signal equipment (including conductors) shall not be less than is required for the spacing between supply conductors and signal conductors in similar situations. (See Table 8.)

(c) *Working Space.* All current-carrying parts of switches, fuses, lightning arresters, also transformer connections and other connections, which may require operation or adjustment while alive and are exposed at such times, shall be so arranged that in their adjustment, while alive, the hand need not be brought nearer to any current-carrying part at a different voltage than the clearance from pole surfaces required in Table 5 for conductors of corresponding voltages.

(d) *Oil Switches.* Where oil-break switches are used, air-break disconnect switches shall be placed between the oil switches and source of supply.

206—Branch Connections.

(a) *Accessibility* (See Figure 2). Connections of branches in supply circuits, service loops, and equipment in overhead construction shall be readily accessible to authorized employees. (See Rules 211b and 202b.)

(b) *Clearance* (See Figure 18). Such connections shall be so supported and spaced that swinging or sagging cannot bring them in contact with other conductors, or interfere with the safe use of pole steps, or reduce the climbing or lateral working space. (See Rule 307.)

207—Lamps.

(a) *Location* (See Figure 12). All exposed metal parts of lamps and all such parts of their support unless effectively insulated from the parts carrying current shall be maintained not less than 20 inches from surface of pole structure if of wood (unless at pole tops) and maintained at a suitable height above roadways and footways.

When lamps are maintained on the side of the pole structure opposite that designated as the climbing side, the clearance may be reduced to 5 inches.

(b) *Material of Suspension* (See Figure 12). The lowering rope or chain for lighting units arranged to be lowered, for examination or maintenance, shall be of a material and strength designed to withstand climatic conditions and to safely sustain the lighting unit. The lowering rope or chain and its supports and fastenings shall be examined periodically.

(c) *Disconnectors* (See Figure 12). A suitable device shall be provided by which each lighting unit on series circuits over 300 volts to ground may be safely and entirely disconnected from the circuit before the lamp is handled, unless the lamps are always worked on from the pole or suitable insulating stools, platforms, or tower wagons, and treated as under full voltage of the circuit concerned.

208—Strength of Poles and Crossarms.

(a) *Poles.* Poles used for lines for which no designated grade is required shall be of such initial size, and so guyed or braced, where necessary, as to safely withstand the loads to which they may be subjected, including linemen working on them.

(b) *Crossarm Bracing.* Crossarms shall be securely supported by bracing, if necessary, so as to safely support loads to which they may be subjected in use, including linemen working on them. Any crossarm or buckarm, except the top one, shall be capable of supporting a vertical

load of 225 pounds at either extremity in addition to the weight of the conductors.

(c) *Location of Crossarms.* In general, crossarms should be maintained at right angles to the axis of the pole and to the direction of the attached conductors, and at crossovers should be attached to that face of the structure away from the crossing, unless special bracing or double crossarms are used.

Double crossarms are generally used at crossings, unbalanced corners, and dead ends in order to permit conductor fastenings at two insulators, and so prevent slipping, although single crossarms might provide sufficient strength. To secure extra strength, double crossarms are frequently used, and crossarm guys are sometimes used.

209—Conductors—Material and Minimum Sizes.

(a) *Material.* All supply conductors shall be of material which will not corrode excessively under the prevailing conditions.

(b) *Minimum Sizes.* Supply conductors in urban districts shall be not smaller than listed in the following table:

TABLE 1		
<i>Minimum Sizes of Supply Conductors (Urban Districts)</i>		
Soft copper		6
Hard or medium-drawn copper		8
Steel		9
Stranded Aluminum:		
Not reinforced	Spans 150 feet or less	Spans over 150 feet
Steel reinforced	1	0
Steel reinforced	6	4

It is recommended that, except as modified hereafter, these minimum sizes for copper and steel be not used in spans longer than 150 feet for heavy-loading districts.

Lightning protection wires shall be regarded, in respect to size and material requirements, as supply conductors.

210—Minimum Sizes and Sags of Service Leads.

(a) *Above 750 Volts.* Supply service leads of over 750 volts to ground shall comply, as to sizes and sags, with the requirements for supply-line conductors of the same voltage.

(b) *Below 750 Volts.* Supply service leads of 750 volts or less in spans not exceeding 150 feet, shall be not smaller than the sizes listed in the table below. Such leads shall have sags not less than 12 inches for spans 100 feet or less, 18 inches for spans up to 125 feet, and 27 inches for spans up to 150 feet.

TABLE 2
Minimum Sizes of Supply Service Leads Below 750 Volts

Situation	GRADE C REQUIREMENTS	
	Spans 150 feet or less	
Alone	{ 10 if soft copper	
Concerned with signal lines	{ 12 if hard copper	
Over supply lines less than 750 volts	{ 12 if steel	
Over trolley lines less than 750 volts	{ 8 if soft copper	
Over any trolley lines in rural districts	{ 10 if hard copper	
Over supply lines of 750 to 7,500 volts	{ 12 if steel	
Over supply lines more than 7,500 volts in rural districts	{ 6 if soft copper	
Over trolley more than 750 volts in urban districts	{ 8 if hard copper	
Over supply lines more than 7,500 volts in urban districts	{ 9 if steel	

Supply service leads of 750 volts or less in spans exceeding 150 feet shall be not smaller than required for grade C in Table 10, Rule 507, and shall have sags not less than required for grade C in the sag tables of Appendix A.

(c) *Cabled Service Leads.* In lieu of separate conductors, supply-

service leads may be grouped together in a cable, no individual conductor of which should be of less size than permitted for separate conductors. The sags should be the same as required above, for the individual conductors, where carried separately.

211—Design and Construction; Accessibility.

(a) *Suitable Design and Construction*—All electrical supply and signal lines and equipment, shall be of suitable design and construction for the service and conditions under which they are to be operated, and all lines shall be so installed and maintained as to reduce the life hazard, as far as practicable.

(b) *Accessibility*—All parts which must be examined or adjusted during operation shall be so arranged as to be readily accessible to authorized persons, by the provision of adequate clearances between conductors and of adequate climbing and working spaces and facilities.

212—Inspection and Tests.

(a) *Lines and Equipment.* Electrical lines and their equipment shall comply with these safety rules when placed in service, and shall, from time to time, be systematically inspected by the person responsible for the installation, and, when necessary, subjected to tests to determine their fitness for service. Any defects revealed by such inspection, shall be recorded, if not promptly corrected. Defective lines and equipment shall be put in good order or effectively disconnected. Lines permanently abandoned, which may create a hazard, shall be removed.

Overhead service loops to consumers are often disconnected without removal when the service is discontinued. This is considered good practice where it is undesirable to remove the service loop entirely.

(b) *Lines Out of Service.* Lines temporarily out of service shall be maintained in such condition that a hazard will not be created. Infrequently used supply lines and their equipment shall be inspected to determine whether they are in safe condition for service.

213—Isolation and Guarding.

(a) *Current-Carrying Parts.* To promote safety to the general public and to employees, not authorized to approach conductors, and other current-carrying parts of electrical supply lines, such parts shall be so arranged as to provide adequate clearance from the ground or other space generally accessible, or shall be provided with necessary guards, so as to effectively isolate them from accidental contact by such persons.

(b) *Noncurrent-Carrying Parts.* In urban districts, ungrounded metal-sheathed service cables, service conduits, metal fixtures, and all similar noncurrent-carrying parts, where liable to become charged to over 300 volts to ground (see Rule 214b) shall be so isolated or guarded as not to be exposed to accidental contact by unauthorized persons. Metal poles not guarded or isolated shall always be specially grounded where in contact with metal-sheathed cable or metal case of equipment operating at over 750 volts.

Metal poles not guarded, isolated, or specially grounded, should always be considered as imperfectly grounded, and the insulators supporting line conductors, as well as the strain insulators in attached span wires, should therefore have a suitable margin of safety and be maintained with special care, to prevent leakage to the pole, as far as practicable.

(c) *Guards and Warning Signs.* If supply conductors exceeding 300 volts to ground are carried on poles stepped nearer than 6.5 feet from the ground or from other readily accessible space, or on closely latticed poles or towers, guards or warning signs should be used, except on fenced rights of way, to protect against careless approach to the conductors by unauthorized persons. Crossarms supporting supply conductors below 750 volts shall be painted red, and crossarms supporting supply conductors of 750 volts and above, but below 15,000 volts, shall be painted yellow.

Exception: On poles carrying signal cable or twisted pairs below supply conductors, a wood block may be placed on the pole not less than 2.5 feet from the ground or other readily accessible place without necessitating the use of guards or warning signs.

214—*Working on Live Lines.*

In general, it is not recommended that men be permitted to work on lines above 7,500 volts energized. It is recognized that certain special devices have been developed which permit working on live lines of higher voltage with comparative safety; however, extra precautions should be taken where such devices are employed. In all cases it is highly desirable to avoid working on lines over 750 volts while energized. Only men known to be careful and experienced should be permitted to work on such lines and in these cases recognized safety appliances, such as gloves, protective shields, etc., shall be employed. If practical, it is recommended that when lines are worked on while energized two men be employed.

215—*Grounding Circuits and Equipment.*

(a) *Methods.* All lightning arrester grounding, except for signal circuit arresters, and all grounding of circuits, equipment, or wire run-ways, which is intended to be a permanent protective measure, shall be done in accordance with approved methods.

(b) *Conduit, Cable Sheaths, Hangers, Etc.* In urban districts metal conduit, cable sheaths, frames, cases, or hangers of equipment not effectively guarded from accidental contact of other than properly qualified workmen shall, if nearer than 8 feet to the ground, be permanently grounded, except metal conduit and cable sheaths inclosing signal conductors, or inclosing supply conductors of not over 300 volts to ground and not exposed to probable contact with overhead conductors of over 300 volts to ground. (See Rule 213b.)

Metal conduit above ground, where containing extensions from underground metal-sheathed cable, is considered as sufficiently grounded by sheath, if the sheath itself is in good contact with earth or is connected to a good ground. It is recommended that supply cables have the sheath bonded to any conduit extending above the ground surface.

(c) *Wire Fences.* Wire fences which are subject to serious induced voltages, due to the proximity of supply conductors, shall be permanently and effectively grounded.

Wire fences which, because of their location, are liable to become energized by actual contact with supply conductors, shall be permanently and effectively grounded.

(d) *Transformers.* The neutral in direct- and alternating-current

three-wire distributing systems shall be grounded by direct connection to a water-piping system, or to earth. The neutral of all transformers supplying three-wire 110–220-volt secondary service shall be grounded at the transformers by direct connection to the earth or to water-piping systems or to a ground wire or to the neutral wire of the system, providing said neutral is grounded at a point not farther than 500 feet from the transformers. All secondaries of transformers or transformer banks shall be grounded, provided the voltage from the ground to any wire does not normally exceed 150 volts.

216—*Arrangement of Switches.*

(a) *Indicating.* All switches shall be readily accessible to authorized persons and shall indicate clearly whether open or closed.

(b) *Uniform Position.* To minimize operating errors the handles or control mechanism for switches shall, as far as practicable throughout any system, have the same position when open, and a uniformly different position when closed. Where it is advisable to depart from this practice, the switches should be so marked as to minimize the liability to mistakes in operation.

Oil circuit-breakers operating with toggle-joint mechanisms are permissible.

217—*Identification of Conductors and Poles.*

(a) *All Conductors.* Conductors and equipment of electrical supply lines should be arranged to occupy definite positions throughout, as far as practicable, or shall be so constructed, located, marked, plotted, or numbered as to facilitate identification by employees authorized to work thereon. This does not prohibit systematic transposition of conductors.

(b) *Supporting Structures.* Poles, towers, and other supporting structures, on which are maintained electrical conductors, shall be so constructed, located, marked or numbered, as to facilitate identification by employees authorized to work thereon. Date of installation of such structures shall, where practicable, be recorded by the owner.

218—*Tree Trimming.*

Where trees exist near supply-line or signal conductors, they shall, if practicable, be so trimmed that neither the movement of the trees nor the swinging or increased sagging of conductors in storms or at high temperatures will bring about contact between the conductors and the trees; except that for the lower-voltage conductors, where trimming is difficult, the conductor may be protected against abrasion and against grounding through the tree by interposing between it and the tree a sufficiently nonabsorptive and substantial insulating tubing or strip.

Tree trimming is preferable in all cases. Care, however, should be exercised that trimming is done in a neat and systematic manner.

SECTION III

CLEARANCES AND SEPARATIONS OF WIRES

301—*Clearances of Conductors and Wires at Crossings.*

(a) *Clearances above Railways, Roadways, and Footways* (See Figure 13). The clear space between the lowest overhead line conductor, guy, messenger, arc or trolley span wire, or lightning protection wires

and transformers and the surfaces of rails, streets, highways, alleys, or generally accessible spaces across or along (and above) which the former pass, shall not be less than given in Table 3, at 60°F. with no wind, where the conductor or wire has fixed supports and the span does not exceed 150 feet.

TABLE 3
Clearances in Feet from Ground or Rails*

Nature of Crossing	Signal, guys, spans, lightning-protection wires, supply lines or services less than 750 volts, messengers	750 volts up to 15,000 volts	15,000 to 50,000 volts	Trolley contact wires (not feeder cables)
Crossing above track rails of railroads handling freight cars where brakemen are permitted on top	25 ft.	28 ft.	30 ft.	22 ft.
Crossing along streets, or alleys in urban districts, or crossing streets or roads in rural districts (over the traveled way), or over track rails not included above.	18 ft.	24 ft.	24 ft.	16 ft.
Along roads in rural districts	15 ft.	18 ft.	24 ft.	16 ft.
Crossing above spaces or ways accessible to pedestrians only	12 ft.	15 ft.	17 ft.	16 ft.
Across open country or arid districts		17 ft.	18 ft.	

*For wire crossings over railways handling only cars considerably lower than ordinary freight cars, the clearances of Table 3 may be reduced by an amount equal to the difference in height between the highest car handled and the highest ordinary freight car, but not less than required for street crossings.

*This clearance may be reduced to 25 feet when paralleled by trolley-contact conductor on the same street or highway.

*In communities where 21 feet has been established this clearance may be continued if carefully maintained. The elevation of the contact conductor should be the same in the crossing and next adjacent spans.

*This does not apply to guys which are not carried over, but merely beside, streets or alleys, unless also over driveways. Over roadways to residence garages, 10 feet is sufficient clearance. For signal conductors along roads where the location of the pole relative to fences, ditches, embankments, etc., is such that the ground under the line will never be traveled, except by pedestrians, the clearance above ground may be reduced to 10 feet.

*This clearance is the minimum clear height in the middle of the trolley-contact conductor span, and the point of support at the trolley hanger should be at a height not less than 18 feet above the track rail, thus allowing 2 feet for the total maximum sag at 60°F. in span wire and trolley-contact conductor. For trolley-contact conductors above 1,500 volts to ground this clearance shall be increased by 2 feet.

*Signal conductors below 150 volts to ground need have only 10 feet clearance. Supply or other wires (except trolley-contact wires) if below 150 volts to ground need not have more than 10 feet clearance at entrance to buildings.

*Where with guys crossing streets or alleys the section of the guy concerned is effectively insulated from the highest voltage to which it is exposed, up to 7,500 volts, this value may be decreased, in urban districts, to 16 feet at the side of the traveled way.

Increased Clearances.

1. These clearances apply to spans not exceeding 150 feet. For longer spans they shall be increased by 1 inch for each 10 feet of the excess between 150 and 300 feet and by 1 inch for each 20 feet of the excess beyond 300 feet.

2. For voltages over 50,000 the clearances given shall be increased at the rate of 0.5 inch for each 1,000 volts of the excess.

Supply lines which are built across open country or arid districts are exempt from the provisions of Rule 301a "Increased Clearances," provided the conductors are suspended with proper factors of safety and that the minimum clearances, as set forth in this section, are met.

3. Where the lowest supply conductor at a crossing over track rails is supported by suspension insulators the initial clearances shall be sufficient to prevent the minimum clearances over rails given in Table 3 from being reduced more than 10 per cent

through the breaking of a conductor in either adjoining span. The arrangement of insulators so that they are restrained from displacement toward the crossing will avoid the necessity of any increase over the clearances given.

4. The above increases are cumulative when more than one applies.

(b) *Conductors and Wires Crossing Others* (See Figures 14 and 15). The clear space between the lowest overhead line conductor or wire and any other conductor or wire over which the former crosses (except for crossings between conductors and guy wires or span wires on the same poles, for which see Rule 302), shall not be less than given in Table 4 at 60°F. with no wind, where the upper conductor or wire has fixed supports and the sum of the distances from the point of intersection to the nearer supporting structure of each span does not exceed 100 feet.

Conductors of lines operating at the voltages indicated at the heads of columns should, in general, be installed above those to the left of the table.

TABLE 4
Wire Crossing Clearances

Wires crossed over	Wires crossing over				
	Signal	0 to 750 volts	750 to 7,500 volts	7,500 to 50,000 volts	Guy, messenger, span wires, lightning-protection wires, service loops ^a
Signal (including cables and messenger)	2 ft.	4 ft.	4 ft.	6 ft.	2 ft.
0 to 750	4	2	2	4	2
750 to 7,500	4	2	2	4	4
7,500 to 50,000	6	4	4	4	6
Trolley-contact conductors	4	4	6	6	4
Guy, messenger, span wires, lightning-protection wires, service loops ^a	2	2	4	4	2

^aGuy, messenger, span wires, and lightning-protection wires may be either above or below the conductors by the clearances given. Completely insulated sections of guys to supporting structures having no conductors above 7,500 volts may have less than this clearance from each other. Service loops should not be above supply lines over 750 volts.

^bA clearance of 2 feet may be permitted where the supply conductor is above the signal conductor, provided the crossing is not within 6 feet from any pole concerned in the crossing and the voltage to ground does not exceed 300 volts.

^cTrolley-contact conductors above 750 volts should have at least 6 feet clearance. This clearance should also be provided over lower voltage trolley-contact conductors unless the crossover conductors are beyond reach of a trolley pole leaving the trolley-contact conductor or are suitably protected against damage from trolley poles leaving the trolley-contact conductor.

^dTrolley feeders are exempt from this clearance requirement for trolley-contact conductors if they are at the same nominal potential and of the same system.

Increased Clearances.

1. Where the sum of the distances from the nearest supporting structures of the two spans concerned to their point of intersection exceeds 100 feet, the clearances shall be increased by 2 inches for each 10 feet of the excess between 100 and 200 feet and by 2 inches for each 20 feet of the excess beyond 200 feet.

2. For voltages over 50,000 the clearances shall be increased at the rate of 0.5 inch for each 1,000 volts of the excess.

3. Where the upper line at a crossing between two lines is supported by suspension insulators, the clearances above lines crossed shall be increased sufficiently above those given in Table 4 to prevent the clearances from being reduced by the breaking of a conductor in either adjoining span by more than 25 per cent below the value given in Table 4. The arrangement of insulators so that

they are restrained from displacement toward the crossing will avoid the necessity of any increase over the clearances given.

4. The above increases are cumulative when more than one applies.

302—Minimum Values of Line Conductor Clearances and Horizontal Separations at the Supports.

(a) *Clearances and Separations* (See Figure 18). At any fixed support the clearances of line conductors from their supporting structures and attachments thereto (except insulators to which any conductor is attached), and the horizontal separation between any two line conductors shall be not less than the value given in the following table. The requirements of Rule 303 apply, if they give a greater separation than this rule.

Cables, duplex, triplex, and twisted pair conductors, supported on insulators or messengers, whether single or grouped, are considered single conductors, even though they may contain individual conductors not of the same phase or polarity. Clearances between individual wires or cables supported by the same messenger or between any group and its supporting messenger are not subject to the provisions of this rule.

TABLE 5

Minimum Line-Conductor Clearances and Separations in Inches at Supports

<i>Applying to conductors of the same circuit or of different circuits. (See Rule 304 for lateral working space.)</i>	<i>Classification Concerned</i>		
	<i>Horizontal separation between conductors not of the same phase or polarity</i>	<i>Clearance from span and guy wires attached to the same pole or from vertical or lateral conductors of other circuits</i>	<i>Clearance from surfaces of poles or crossarms or from vertical or lateral conductors of the same circuit</i>
Direct current railway feeders No. 1 or larger, 0-750 volts.....	6	66	3
Railway feeders 750-7,500 volts and direct-current railway below No. 1, 0-750 volts	c12	bdg	3
Supply conductors 0-7,500 volts	c12	bdg	*3
For all conductors above 7,500 volts add, for each kv. over 7,500 volts	0.4	d0.4	0.2

*This does not include service loops under 300 volts.

^bWhere a trolley feeder, supply line, or signal line is supported by the span wire concerned this clearance is not required.

^cWhere a separation of 10 to 12 inches has already been established by practice for spans having apparent sags not over 3 feet (see Appendix A for apparent sags under different loading conditions and in different grades of construction) and for conductor voltage not over 7,500, that minimum separation may be continued, subject to the provisions of Rule 303.

^dClearances from these conductors to guy, span, messenger or lightning-protection wires run in the direction of the line, shall be not less than the separation required between two line conductors of the voltage concerned.

(b) *Location of Wires* (See Figure 16). Supply lines of any one voltage classification may be maintained on the same crossarm with supply lines of the next consecutive classification if (1) They occupy pin positions on opposite sides of a pole; or if (2) In bridge-arm construction they are separated by a distance of not less than the climbing space required for the higher voltage concerned and provided for in Rule 306; if (3) The higher voltage conductors occupy the outer pin positions, and (4) Constant-current circuits should occupy the outer pin position on the street side of the pole.

303—Required Line-Conductor Clearances and Separations at the Supports.

(a) *Line-Conductor Separations According to the Sags Concerned.* The separation, at the supports, of the conductors of the same or different circuits of grades A, B, or C, shall in no case be less than the values given by the following tables, at 60°F. with no wind. The requirements of Rule 302 apply if they give a greater separation than this rule.

Separation in inches required for line conductors smaller than No. 2 A.W.G.

Formula: Separation = 0.2 in. per kv. + $6\sqrt[3]{S}$ - 8, where S is the apparent sag in inches of the conductor having the greater sag, and the resultant separation is in inches. (See exception under Table 5, note c.)

TABLE 6

Voltage	Sag in Inches					
	36	48	72	96	120	240
750.....	12.0	17.0	24.0	29.0	34.0	51.0
2,200.....	12.5	17.5	24.5	30.0	35.0	52.0
6,000.....	13.5	18.5	25.5	31.0	36.0	53.0
22,000.....	16.5	21.5	28.5	34.0	39.0	55.0
44,000.....	21.0	26.0	33.0	38.0	43.0	60.0
66,000.....	25.0	30.0	37.0	43.0	47.0	64.0

Separation in inches required for line conductors, No. 2 A.W.G. or larger.

Formula: Separation = 0.2 in. per kv. + $7\sqrt[3]{S}$ - 12, where S is the apparent sag in inches of the conductor having the greater sag, and the resultant separation is in inches. (See exception under Table 5, note c.)

TABLE 7

Voltage	Sag in Inches					
	36	48	72	96	120	240
750.....	12.0	14.0	17.0	20.0	22.0	31.0
2,200.....	12.5	14.5	17.5	21.0	23.0	32.0
6,000.....	13.5	15.5	18.5	21.0	24.0	33.0
22,000.....	16.5	18.5	21.5	24.0	27.0	36.0
44,000.....	21.0	23.0	26.0	29.0	31.0	40.0
66,000.....	25.5	27.0	30.5	33.0	36.0	45.0

For other voltages, separations may be calculated by formulæ.

(b) *Increased Line-Conductor Separations and Clearances at the Supports if Suspension Insulators are Used.* (1) Where suspension insulators are used and are not restrained from movement, the values of conductor separation required by Table 8, or by (a) above, shall be increased by one-half the length of the suspension insulator string. (2) Where suspension insulators are used and are not restrained from movement, the conductor clearances from surfaces of supports, from span or guy wires, or from vertical or lateral conductors shall be such that the values of clearances required by Table 5 will be maintained with an insulator swing of 45° from the vertical position.

304—Minimum—Lateral Working Space and Vertical Separation between Conductors at Different Levels (See Figure 17).

(a) *Height of Working Space.* The lateral working space between supply conductors and between supply and signal conductors at different levels, shall have an approximate vertical height of not less than that given in Table 8 with a minimum of 2 feet.

(b) *Width of Working Space.* This space on the climbing side of

the pole extends laterally from each side of the climbing space to the outer pin position of the arm, and with a minimum horizontal width from the face of the crossarm equal to the width of the climbing space required for the highest voltage conductors concerned. (See Rule 306.)

(c) *Freedom from Obstructions.* No vertical or lateral conductors shall obstruct this working space. Such conductors, if not on the opposite side of the pole from the climbing side, must be at least as far from the crossarms as the width of the climbing space required for the highest voltage conductors concerned.

(d) *Only One Buckarm* (See Figure 18). Since buckarms obstruct the lateral working space between line conductors, not more than one single or double buckarm shall be placed on any pole, unless the voltage of all conductors concerned on the buckarms and adjacent line crossarms above and below does not exceed 750, or unless the lateral working space required by Table 8 is provided between the conductors attached to the buckarm and the conductors on the adjacent line arm to which the conductors on the buckarm are not connected. This may be accomplished by increasing the spacing between the line crossarm gains.

TABLE 8

Minimum Vertical Separations, in Feet, Between Line Conductors of the Same or Different Voltage Classifications when Carried on the Same Structures but on Different Crossarms.

In general, conductors of lines operating at the voltages indicated at the heads of columns are to be installed at levels above those at lower voltages to the left of the table when carried on the same structures with the exceptions below, and except that trolley-contact conductors and their associated feeders, which for convenience are carried at approximately the same level, are to be installed at levels below signal lines, at least 4 feet below signal lines for public use and at least 2 feet below signal lines used in operation of supply lines. For grades of construction of the higher lines see Section IV. The specified clearances usually indicate the minimum vertical separation between parallel crossarms (center to center) at the pole, and where these clearances are provided between the centers of crossarms, the clearance of the conductors supported thereon may be reduced below those given in the table by an amount not to exceed 8 inches where tabular clearance is 2 feet or 4 feet, and by an amount not to exceed 12 inches where the tabular clearance is 6 feet.

	Supply conductors at higher levels			
	0 to 750 volts	750 to 7,500 volts ^a	7,500 to 15,000 volts ^a	15,000 to 50,000 volts
Conductors at lower levels				Different utilities Same utility
Signal lines.....	c4	4	6	6
Signal lines used in the operation of supply lines.....	2	b2	4	6 4
0 to 750.....	2	2	4	6 4
750 to 7,500.....	--	2	4	6 4
7,500 to 15,000.....	--	--	2	4 4

^aWhere lines are operated by different utilities, a minimum vertical spacing between the respective conductor levels of 4 feet is recommended.

^bThis shall be increased to 4 feet when the signal conductors are carried above supply conductors unless the signal line conductor size is that required for grade C supply lines.

^cIn localities where the practice has been established of placing on jointly used poles crossarms carrying supply circuits of less than 300 volts to ground and crossarms carrying signal circuits at a vertical separation less than specified in the table, such existing construction (provided the minimum separation between the crossarms in question is not less than 2 feet) may be continued until the said poles are replaced; provided, however, that extensions to the existing construction shall conform to the clearance requirements specified in the table.

When signal lines are all in cable, a supply crossarm carrying only wires not exceeding 300 volts to ground may be placed at not less than 2 feet above the point of attachment of the cable to the pole; provided, that the nearest supply wire on such crossarm shall be at least 30 inches horizontally from the center of the pole, and that the cable be placed so as not otherwise to obstruct the climbing space. (See Rule 306i.)

(e) *Vertical Arrangement of Conductors* (See Figure 17). Supply conductors of the same circuit arranged vertically on separate cross-

arms may occupy the same crossarms with supply conductors of the next consecutive classification (see Table 8), similarly arranged, provided the clearance (Rule 302) and climbing space (Rule 306) specified for the higher voltage are maintained at each level concerned. When so arranged, the minimum vertical separation between crossarms shall be that required in Table 8 for the highest voltage concerned.

(f) *Exceptions* (See Figure 19). The provisions of this rule do not apply to the vertical spacings between lines at different levels where men are not permitted to enter the spaces while the lines are alive, or between conductors below 750 volts, where normal spans do not exceed 150 feet and conductors are carried on vertical racks at one side of the pole, if the full width of climbing space is maintained past the rack and at least 4 feet above and below. Where conductors, all of one material and either of one size, or arranged with the smaller conductors below those of the larger size, are supported on vertical racks in spans averaging not to exceed 150 feet, a vertical separation of 4 inches may be used.

305—Conductors of Different Sags on the Same Supports.

(a) *Variation in Clearance* (See Figure 20). Line conductors supported at different levels on the same structure and strung to different sags shall have vertical spacings at the supporting structures so adjusted that the minimum spacing at any point in the span, at 60°F. with no wind, shall not be reduced more than 25 per cent from that provided for by Rules 302, 303, and 304, above, at the supports.

(b) *Readjustment of Sags*. Sags should be readjusted when necessary to accomplish the foregoing, but not reduced sufficiently to conflict with the requirements of Rule 507.

In cases where conductors of different sizes are strung to the same sag for the sake of appearance or to maintain unreduced clearances throughout storms, the chosen sag should be such as will keep the smallest conductor involved in compliance with the sag requirements of Rule 507.

306—Climbing Space.

(a) *Supply Lines in General* (See Figures 17 and 21). All poles or structures carrying crossarms on which supply conductors are carried shall be arranged and maintained so as to provide an unobstructed vertical climbing space between such line conductors of not less than 26 inches horizontally each way, and extending at least 4 feet above and below the conductors concerned. The climbing space need be on one side or corner only, of the pole structure. All supply lines must be at least 13 inches from the center of poles. Where double crossarms are not used on any one pole and all crossarms are parallel, it is recommended that the crossarms be on the same side of the pole.

(b) *Above 7,500 Volts*. When men must climb between live conductors between 7,500 and 15,000 volts, the climbing space shall be increased to 36 inches.

(c) *Signal Conductors Below Supply Conductors* (See Figure 22). When signal conductors are carried on the same pole and below supply conductors, the same climbing space shall be provided through the signal conductors as is required for the supply conductors immediately above.

(d) *Signal Conductors Above Supply Conductors* (See Figure 23). When signal conductors are carried on the same pole and above supply conductors, the climbing space required for the supply conductors shall extend up to a point at least 48 inches above the highest supply conductors carried on the pole and at least 6 feet above where the supply conductors exceed 7,500 volts.

(e) *Signal Conductors Only*. It is recommended that poles carrying only signal conductors when these are above 150 volts to ground, be provided with a climbing space at least 24 inches horizontally each way.

(f) *Where No Work Is Ever Done on Live Lines*. The rule is not intended to apply to conductors above 15,000 volts, unless men climb between them while they are alive, in which case the climbing space of 36 inches provided for 15,000 volts in paragraph (b), section 306, shall be increased by one inch (1") for each 1,000 volts by which the maximum line voltage exceeds 15,000 volts. The rule is also not intended to apply to conductors lower than 15,000 volts, if the unvarying practice and rules of the employers concerned prohibit employees from ascending beyond the conductors of the given line, unless the lines are killed or protected by suitable shields. In such cases a 26-inch climbing space is permissible.

(g) *Protected Vertical Conductors*. Vertical runs incased in suitable conduit or other protective covering (see Rule 307e) and securely attached to the surface of the pole or structure, or the pole or structure itself when included in one side or corner of this space at buck- or reverse-arm construction, are not considered to obstruct the climbing space.

(h) *Protected Longitudinal Runs* (See Figure 19). Longitudinal runs of cable or conductors are not considered to obstruct the climbing space if no supply-line conductors carried on crossarms are within 4 feet, either above or below (see also exception in certain cases under note c. Table 8). But such cables or conductors must be protected where within 20 inches, in each direction, from pole center by suitable guard arms securely fastened to the pole, or by substantial insulating conduit, unless located above supply-line conductors or at least 6 feet below. If grounded metal-sheathed cables are uninsulated from metal supports attached to wood poles, similar protection shall be provided for such supports for at least 24 inches from the pole center.

(i) *Special Clearance for Longitudinal Runs* (See Figure 19). In cases where longitudinal runs of supply conductors not over 750 volts are supported near the surface of the pole, as by brackets or racks, or on pins close to the pole, unless they are located at levels at least 4 feet above or below other supply conductors carried on crossarms, sufficient side clearance from the pole center shall be provided for the line conductors on the adjacent crossarms to afford the full width climbing space for at least 4 feet above and below the longitudinal run concerned.

(j) *Obstructions*. All poles should be kept free from posters, bills, tacks, nails, and other unnecessary obstructions, such as through-bolts with jagged ends.

307—Clearances of Vertical and Lateral Conductors.

(a) *Climbing and Working Spaces*. Vertical and lateral conductors,

ground wires, and metal-sheathed cables shall not obstruct the vertical climbing space (for exception see Rule 306), or the lateral working space between line conductors at different levels (see Rule 304), or interfere with the safe use of pole steps, where such are installed.

(b) *Vertical Supply and Signal Conductors Through Supply Circuits* (See Figures 24 and 25). Vertical conductors (except where especially protected, as per (e) below) not exceeding 7,500 volts shall clear pole centers by not less than 15 inches for a distance of not less than 4 feet above and below any open supply-line conductors which do not exceed 7,500 volts when the latter are carried on or within 4 feet from the pole. If the vertical conductors exceed 7,500 volts, this clearance shall be not less than 20 inches. If the supply-line conductors exceed 7,500 volts, the clearance from pole center shall apply for a distance not less than 6 feet above and below. This practice is not recommended where it is practical to employ the methods outlined in (e) below.

(c) *Vertical Supply Conductors Through Signal Circuits on Poles Used Jointly by Supply and Signal Circuits*. Vertical supply conductors which run through a space occupied by signal circuits shall be inclosed from a point 4 feet above the highest signal conductor or equipment, if the supply wire is below 7,500 volts, or from a point 6 feet above the highest signal conductor or equipment if the supply wire is 7,500 volts or over, in insulating conduit, except that where more than 6 feet below the lowest signal conductor or equipment iron pipe may be used or supply conductors mounted on pins and insulators as provided in (e) below.

Vertical supply circuit ground wires which run through the space occupied by signal circuits shall be covered by wood or other insulating conduit from a point not less than 4 feet above the highest signal conductor or equipment to the ground, except that within 8 feet of the ground suitable mechanical protection as required by (g) below may be used.

(d) *Clearances Between Conductors and from Conductors to Surfaces of Structures* (See Figure 26). Vertical and lateral conductors except where protected as per (e), below, shall have the following minimum separations and clearances from other conductors, pole surfaces, and guy, span, or messenger wires:

(1) From surfaces of supports and from other conductors of the same circuit, 3 in. + 0.2 in. per kv. (highest voltage concerned) over 7,500 volts. See also (e) 2, below.

(2) From span, guy or messenger wires and from conductors of other circuits, 6 in. + 0.2 in. per kv. (highest voltage concerned) over 7,500 volts.

(3) From conductors on other supports as provided in Rule 308.

The foregoing minimums are for situations where all conductors are rigidly supported on fixed supports. Where not so supported, greater separation and clearances shall be used. (See Rule 303b.)

(e) *Specially Protected Conductors* (See Figures 27, 28, and 29). Vertical and lateral conductors may have less clearances than required by (a), (b), and (d), if they have suitable insulating coverings and are incased in conduit or other substantial casing (either of which is

insulating, except on metal poles.) On poles used for supply lines the conduit may be omitted for conductors less than 7,500 volts, and on poles used jointly for supply and signal circuits the conduit may be omitted for street-lighting circuits and service leads below 750 volts, if in lieu of conduit the following construction be used:

(1) Vertical and lateral supply conductors may be run on the pole in multiple-conductor cable having suitable substantial insulating covering if such cable is held taut on standard insulators supported on pins or brackets, and so arranged that the cable shall be held at a distance of approximately 5 inches away from the surface of the pole and from any pole step, and as far away from the climbing space as practicable, and if the pole is stepped up to the lowest crossarm. Where within 8 feet from the ground a suitable mechanical protection shall be provided for all such conductors.

(2) Vertical and lateral signal conductors may be attached directly to the surface of the pole structure by means of rings, knobs, or brackets, provided they are rubber-insulated twisted pair and do not obstruct the vertical climbing space or reduce the clearances provided in Rules 301 and 305, or come within 4 feet from open supply lines of under 7,500 volts or within 6 feet from open supply lines of over 7,500 volts, whether carried on the same or other supporting structures. Where within such distances, either the signal or supply conductors shall be incased in insulating conduit or in other substantial insulating and protective covering. Where within 8 feet from the ground a suitable mechanical protection shall be provided for all such conductors.

(f) *Ground Wires and Grounded Metal-Sheathed Cables* (See Figures 30 and 31). Vertical and lateral ground wires and grounded metal-sheathed cables, except where arranged as noted in (1) or (2) below, shall have separations from other conductors and clearances from surfaces of supporting structures (unless metal) and from pole centers (unless crossarms are metal) not less than those required by Rules 302 and 306 and by paragraphs (a), (b), (d), and (e), above, for conductors with which these wires or cables are associated.

It is not intended to prohibit the placing of supply circuits of the same or next voltage classification in the same iron pipe if each circuit or set of wires be inclosed in a lead sheath.

(1) Where within the above clearances, they shall be inclosed in suitable insulating conduit (or wood molding if wire be used having substantial weatherproof insulation), wherever within 4 feet from any open supply lines of less than 7,500 volts or within 6 feet from supply lines of less than 7,500 volts or within 6 feet from such supply lines of over 7,500 volts, whether carried on the same or other poles.

(2) In side-arm construction having only supply lines, and these carried on one side of the pole, the insulating conduit may, if necessary, be omitted, provided that the ground wires or metal-sheathed cables are placed on the opposite side of the pole from the line conductors and at least 5 inches away from pole steps located within 6 feet from any line conductor.

It is recommended that where practicable the ground wire or cable be insulated from wood poles by nonabsorptive insulators or insulating tubing.

(g) *Mechanical Protection for Ground Wires* (See Figure 32). Where within 8 feet from the ground, a suitable mechanical protective covering shall be provided over all ground wires and metal-sheathed cable, except in rural districts. Such protective covering, if for the only ground wire of a lightning arrester, shall be of insulating material.

(h) *Conductors Not in Conduit*. Conductors not incased in conduits shall have the same clearances from conduits as from other surfaces of structures.

(i) *Where No Work Is Done on Live Lines*. The provisions of (a), (b), (e), and (f) of this rule do not apply to portions of a pole which workmen do not ascend while the conductors in question are alive.

308—Clearances of Conductors of One Line from Poles of Another Line (See Figure 33).

(a) Where conductors of one line are carried within 6 feet from a supporting structure of a second line, and are not attached thereto, the clearance between the conductors of the first line and any part of the supporting structure of the second line, shall, if practicable, be not less than 3 feet at 60°F. and no wind. In no case should this clearance be less than the values required by Rules 302 and 303 for separation between similar conductors on the same support, increased by 1 inch for each 2 feet of the distance from the supporting structure of the second line to the nearest supporting structure of the first line. The climbing space on the structure of the second line shall in no case be reduced by a conductor of the first line.

(b) *Clearance from Conductors*. The clearance in any direction, at 60°F. and no wind, of any conductor of one line from any conductor of a second and conflicting line shall not be less than required by Rules 302 and 303 for separation between conductors on the same support, and shall not be less than 4 feet. It shall be at least equal to the normal sag of the conductor having the greater sag, plus 0.2 inch per kilovolt of the highest voltage concerned.

309—Clearances from Buildings.

(a) *General*. Conductors should be so arranged and maintained as to hamper and endanger firemen as little as practicable in the performance of their duties.

(b) *Ladder Space* (See Figure 34). Where buildings exceed three stories, or 50 feet, in height, overhead lines should be arranged where practicable, so that a clear space or zone at least 6 feet wide will be left, either adjacent to the building or beginning not over 8 feet from the building, to facilitate the raising of ladders when necessary for fire fighting.

(c) *Clearances—Lines 300 to 7,500 Volts* (See Figure 34). Supply conductors between 300 volts to ground and 7,500 volts (unless in grounded conduit or metal-sheathed cable or otherwise adequately guarded or rendered inaccessible) shall be so arranged that they do not come nearer than 3 feet, measured horizontally, from any point on the surface of a building or its attachments, or nearer than 8 feet above the top of any building or above any balcony or other platform crossed over.

(d) *Guards*. Where the above clearances cannot be provided, and

where supply conductors are placed near enough to windows, verandas, fire escapes, or other ordinarily accessible places to be exposed to contact of persons, the conductors shall be properly guarded by conduit, barriers, or otherwise.

(e) *Where Attached to Buildings* (See Figure 35). Where the permanent attachment of open supply conductors of any class to buildings is necessary for an entrance, conductors shall not be carried along or near the surface of the building unless they are guarded or made inaccessible where over 300 volts to ground and have separations from each other and clearances from building surfaces not less than those required by Table 5, for separation of conductors and clearances from pole surface.

(f) *Clearances—Lines Over 7,500 Volts.* Conductors operating at over 7,500 volts (unless in grounded conduit or metal-sheathed cable or otherwise adequately guarded or rendered inaccessible) shall be so arranged that they clear the surfaces of roofs or buildings or their attachments by not less than 8 feet up to 15,000 volts and 10 feet for higher voltages. They should not be carried over buildings not concerned in the operation of the utility owning them where this can be avoided.

310—Clearances from Bridges.

(a) *Accessible Portions.* Supply conductors, unless in grounded conduit or metal-sheathed cable, shall be so arranged that they do not come within 3 feet from any readily accessible wing wall or other readily accessible portion of any bridge or its attachments. For voltages higher than 7,500 volts the minimum clearance shall be not less than required by paragraph (b) or (c).

(b) *Ordinarily Inaccessible Portions—Where Attached.* Open supply conductors passing under, over, or near a bridge (other than brick, concrete, or masonry, requiring infrequent inspection or repair), when attached thereto, shall, when practicable, be so arranged that they do not come within the following distances from any portion of the bridge or abutments:

Operating Voltage	Clearance
0 to 2,500.....	6.0 inches
2,500 to 5,000.....	1.0 foot
5,000 to 7,500.....	3.0 feet
7,500 to 15,000.....	5.0 feet
15,000 to 50,000.....	7.5 feet

(c) *Ordinarily Inaccessible Portions—Where Not Attached.* Open supply conductors passing over, under, or near a bridge (as in (b) above), and not attached thereto shall be so arranged that they do not come within the following distances from any portion of the bridge or abutments:

Operating Voltage	Clearance in Feet
Up to 7,500.....	8.0
7,500 to 15,000.....	5.0
15,000 to 25,000.....	7.5
25,000 to 35,000.....	9.0
Exceeding 35,000.....	12.0

The clearances as given above are minimums and should be increased as much as practicable.

(d) *Separations.* Where supply conductors attached to bridges are supported at frequent intervals, their separation may be less than that

specified in Rules 302 and 303, but not less than that required by Rule 302, for clearances from surfaces of poles and crossarms, or less than the following:

Span Length	Separation in Inches
Up to 20 feet.....	6
20 to 50 feet.....	9

(e) *Trolley-Contact Conductors.* Trolley-contact conductors attached to the under surfaces of bridges shall be provided with a substantial inverted trough of nonconducting material, or other suitable means shall be taken to keep the trolley pole from making connection between the trolley-contact conductor and the bridge structure.

(f) *Warning Signs.* The pin-supporting structure attached to bridges shall be plainly marked with the name, initials, or trade-mark of the utility responsible for the attachment, and in addition, when the voltage of the conductors exceeds 750 volts, by the following or equivalent sign: "Danger—Do Not Touch."

SECTION IV

CLASSIFICATION OF CIRCUITS ACCORDING TO THE GRADE OF CONSTRUCTION REQUIRED

401—Required Grades of Overhead Line Construction, and Arrangement of Levels.

(a) *Various Conditions of Hazard.* Supply and signal lines* (1) when concerned in crossings or conflicts, (2) where carried on the same supports with other lines, (3) and in some cases where carried through urban districts, shall have mechanical construction of the grade designated as A, B, C, D, or E, according to the hazard involved. The conditions determining each grade of construction are defined in the following rules of this section:

Where none of these conditions exist, no specified grade of mechanical construction is required, but the general requirements of Sections II and III must be met.

Grades of construction A, B, and C are described in Section V. Grades of construction D and E are described in Section IX. In any case where two or more of the conditions listed below exist, the grade of construction shall be the highest called for under any item applying.

(b) *Arrangement of Relative Levels.* Where supply and signal lines or supply lines of different voltage classification cross each other or are in conflict, or are on the same poles or towers, the higher voltage lines shall preferably be carried at the higher levels.

It is recommended that, where practicable, lines be arranged by mutual agreement of the utilities concerned, at standardized levels throughout a given community, in order to minimize difficulties when new crossings or extensions to existing lines are to be installed. (See also Rule 301b for relative levels.)

(c) *Avoidance of Conflict.* Two parallel pole lines, either of which carries supply lines, shall, where practicable, be so separated from each other that neither conflicts with the other.

*The rules referring to signal lines apply to all signal lines except those used in the operation of supply lines, and their application to these is determined by one of the construction methods applied to the signal lines and to neighboring lines as given in Rule 910.

It is recommended that overhead lines, which cannot readily be so separated from each other as not to conflict, be placed on a single common pole line unless the high voltage of certain of the circuits, or the large number of conductors, makes the use of a single pole line undesirable or impracticable.

(d) *Limitation of Joint Use.* The joint use of poles by signal lines and supply lines above 7,500 volts (or 4,400 volts to neutral or ground) is not recommended except where it is impracticable to separate the lines sufficiently to avoid conflicts.

Between 5,000 and 7,500 volts (or between 2,900 and 4,400 volts to neutral or ground) conditions in particular cases will determine whether joint use of poles is permissible.

402—Supply Lines in Urban Districts (See Rule 602).

Supply lines under this classification shall be considered in accordance with the following tabulation:

<i>Classification of Supply Line—Urban Districts</i>	<i>Grade Required</i>
(a) Over 7,500 volts.....	*B
(b) Any voltage when above 7,500 volt lines.....	*B
(c) Between 750 and 7,500 volts.....	*C
(d) Below 750 volts, when above lines between 750 and 7,500 volts	*C
(e) Between 750 and 7,500 volts if in cable.....	None
(f) Below 750 volts alone, concerned only with signal lines or other lines below 750 volts or both.....	None, but must comply with Sections II and III

NOTE: *Lines in these classifications when on fenced rights of way need not comply with the above requirements except where crossing over, conflicting with, or higher on joint poles with the conductors of other lines.

Constant-current circuits are included in (a) and (c) above, the voltage being the nominal full-load voltage.

403—Supply Lines in Rural Districts (See Rule 603).

Supply lines in such districts shall be constructed in accordance with the following tabulation:

<i>Classification of Supply Lines</i>	<i>Grade Required</i>
(a) When either of two lines, one above 7,500 volts, and the other below 750 volts, are involved in crossings or conflicts, upper line shall be.....	*C
(b) Above 7,500, where alone or considered only with supply lines above 750 volts.....	None, but must comply with Sections II and III

NOTE: *Service Crossings. Supply lines above 7,500 volts are exempted from this requirement if crossing over or conflicting only with service connections from supply lines.

Constant-current circuits are included in (a) and (b) above, the voltage being the nominal full-load voltage.

404—Supply Lines Crossing Over Railways (See Section VII).

Supply lines carried over railways shall be constructed in accordance with the following tabulation:

<i>Classification of Railway</i>	<i>Grade Required</i>
(a) Operated by steam, electric or other motive power except as in (b) and (c) below	A
(b) Siding not exceeding four tracks, spurs, branches, or other minor tracks, operated as in (a) and except as noted in (c), (classification as per 406b)	*B
(c) Street railways on traveled portions of highways.....	None, must meet requirements of Sections II and III, and Rules 402 and 403, supply lines of equal voltage

NOTE: *Minor tracks generally are those having not more than a single parallel signal circuit. Signal circuits carried over a different right of way for part of their route, but concerned in the operation of the railway lines, are included as parallel signal circuits, within the intent of this paragraph.

405—Supply Lines in Crossings, Conflicts, and Joint Use of Poles with Signal Lines (See Section VIII).

The following tabulation classifies supply lines coming under this heading as to the grades of construction required:

<i>Classification of Supply Line</i>	<i>Grade Required</i>
(a) Over 7,500 volts (or 4,400 volts to neutral or ground), or constant-current circuits exceeding 10 amps. d.c. trolley over 750 volts to ground when above signal lines.....	A
(b) Where the supply lines as in (a) are over signal lines used mainly for local exchange service, not exceeding four wires, or over subscriber's loops, or over two local telegraph wires, or fire-alarm wires.....	B
(c) Between 5,000 or 7,500 volts (or between 2,900 and 4,400 volts to neutral or ground) or constant-current circuits between 7.5 and 10 amps. when above signal lines.....	B
(d) Supply lines as per (c), over signal lines as per (b) above.....	C
(e) Between 750 and 5,000 volts between conductors (or between 440 and 2,900 volts to neutral or ground), and constant-current circuits not exceeding 7.5 amps. when above signal lines.....	C
(f) Signal lines at higher levels than d.c. grounded trolley circuits of over 750 volts.....	A (So far as mechanical strength is concerned)
(g) Signal lines at higher levels than trolley-contact conductors below 750 volts to ground.....	C (As to conductor sizes and sags. For exceptions see Rule 907)

NOTE: (1) *Double Crossing.* Where a line crosses in one span over two other lines, the strength of construction shall be not less than would be required if either of the two lower lines crossed the other.

For example, if a 2,300-volt line crosses in the same span over a signal line and a direct-current trolley line over 750 volts, the 2,300-volt line would be required to comply with grade A construction at the crossing. This is a double crossing and introduces a greater hazard than where the upper supply line crosses the signal line only.

(2) *Inverted Levels.* In other situations, signal lines carried at higher levels than supply lines in crossings, conflicts, or joint use of poles, shall comply with the grade of construction required for the supply lines by (a), (c), or (e) above if in the reversed position, so far as mechanical strength is concerned, except as smaller wire sizes are permitted by Rule 906 for grade C signal lines.

406—Signal Lines Crossing Over Railways (See Section IX).

The following tabulation classifies signal lines as to the grade of construction required, under this heading:

<i>Classification of Railway</i>	<i>Grade Required</i>
(a) Operated by steam, electric or other motive power.....	D
(b) 1. Spurs not exceeding two tracks in the same span.....	E
2. Branches on which no regular schedule of operation is maintained.....	E
3. Narrow-gage tracks or other tracks on which standard rolling stock cannot be operated.....	E
4. Tracks used temporarily for construction or similar purposes for a period not exceeding one year.....	E
5. Not operated as a public utility, such as industrial railways used in mining, logging, etc.....	E
(c) Street railways not having overhead trolley-contact conductors.....	None. See Sections II and III, also Rule 909, general requirements
(d) 1. Trolleys having contact conductors, below 750 volts to ground.....	Rule 907
2. Trolleys having contact conductors above 750 volts (d.c.) to ground.....	A
(e) Trolleys having contact conductors above 750 volts (a.c.) to ground, depending on the voltage.....	A, B, or C

NOTE: *Signal Lines Classed as Supply Lines.* Signal lines which are classed as supply lines shall, where crossing over railways, comply with the construction requirements of Rule 404. (See Rule 909.)

SECTION V

SPECIFICATION FOR STRENGTH AND OTHER REQUIREMENTS FOR SUPPLY
LINES OF GRADES A, B, AND C501—*Preliminary Assumptions.*

In the calculation of all stresses, no allowance shall be made for deformation, deflection, or displacement of any part of the supporting structures. The effect of certain influences which diminish the effective stresses resulting from the assumed loadings has received careful consideration by reducing (below what would otherwise be considered proper) the assumed loadings upon which are based the strength requirements of the several parts of the line—namely, conductors, fastenings, and pole or tower structures.

502—*Loads Assumed in Determining Stresses in Conductors.*

(a) *Assumed Loading of Wires.* In computing the longitudinal stresses upon conductors and their supports, and the sags corresponding to given limiting stresses in conductors, the loading shall be assumed as one of the following, according to climatic conditions of the locality concerned.

(1) *Heavy Loading (H)*—The resultant loading due to the weight of the conductor plus the added weight of a layer of ice one-half inch in radial thickness, combined with a transverse horizontal wind pressure of 8 pounds per square foot on the projected diameter of the ice-covered conductor, shall be called heavy loading. The minimum temperature shall be assumed as 0°F.

(2) *Medium Loading (M)*—The resultant loading equal to two-thirds that specified in (1) above, but in no case less than 25 per cent in excess of the weight of the conductor, shall be called medium loading. The minimum temperature shall be assumed as 15°F.

Only with copper conductors of 400,000 circular mils or larger size or with very large conductors of other material is the resultant loading less than 25 per cent in excess of the conductor weight.

(3) *Light Loading (L)*—The resultant loading equal to two-thirds that specified in (2) above or four-ninths that of (1), but in no case less than 25 per cent in excess of the weight of the conductor, shall be called light loading. The minimum temperature shall be assumed as 30°F.

Only with copper conductors of No. 000 or larger size or with very large conductors of other material is the resultant loading less than 25 per cent in excess of the conductor weight.

Heavy loading for conductors consists of a horizontal wind pressure of 8 pounds per square foot of projected area and a half-inch of ice. Since the stress in the conductor in general does not exceed one-half the breaking strength for grades A and B, and 60 per cent for grade C, this corresponds to a factor of safety of 2 for grade A and B and $1\frac{2}{3}$ for grade C, based upon an 8-pound wind and the ultimate strength of the conductor.

(See Table 29 of Appendix A for resultant loads on conductors.)

(b) *Loading Map.* Two districts have been outlined in which

medium and light loading are considered to be justified by weather reports as to wind and ice and by local experience of the utilities using overhead lines. A map of the State of Nevada showing the territory falling into each class of loading is given in Appendix D. No heavy-loading area is outlined on this map, but there exists certain areas in this State at elevations above 5,000 feet where heavy loading should be considered.

The localities in the different groups are classed according to the relative prevalence of high-wind velocity and thickness of ice which accumulates on wires, light loading being in general for places where little if any ice ever accumulates on wires.

Where high wind velocities are frequent in a given place the loading for that place may be classed as heavy, even though ice does not accumulate to any greater extent than at some other place having less severe winds which has been classed as a medium-loading district.

503—Calculation of Loads upon Line Supports.

(a) *Vertical Loads.* The vertical loads upon poles, towers, and crossarms shall be taken as their own weight, plus the weight of the ice-covered conductors supported. The thickness of ice shall be taken as one-half inch in regions of heavy loading, one-fourth inch in regions of medium loading, and no ice shall be considered in regions of light loading. (See Appendix B, Table 31, for vertical loads on conductors.)

(b) *Transverse Wind Pressures.* In computing the transverse stresses upon poles and towers, horizontal wind pressures at right angles to the direction of the line, upon the poles, towers, and conductors, shall be as per Table 9.

The pressure shall be computed for the poles and towers without ice covering, while conductors are assumed to be covered with a layer of ice one-half inch in radial thickness.*

TABLE 9
Transverse Wind Loadings for Supply Lines and Towers
(Pressure in pounds square feet of projected area for cylindrical surfaces.)

Loading District	Grade of Construction		
	A	B	C
H.....	12	8	5.4
M.....	8	5.4	3.6
L.....	5.4	3.6	2.4

(c) *Flat Surfaces and Latticed Structures.* For flat surfaces the assumed unit pressure shall be increased by 60 per cent. Where latticed structures are concerned, the actual exposed areas of one lateral face shall be increased by 50 per cent to allow for the pressure on the opposite face. If, however, this method of computing pressure on latticed structures indicates a greater total pressure than would occur on a solid structure of the same outside dimensions, the latter shall be taken as the limit.†

(d) *Calculated Loads—Poles, Towers and Crossarms.* The calculated loads upon poles, towers and crossarms shall be based upon the average span length of a section of line that is reasonably uniform as to height, number of wires, grade and span length, except that the

*Certain signal conductors are exempted in computing transverse stresses. (See Rule 803.)

†The above figures are for average conditions. In the case where more exact calculations are made from actual designs and dimensions the results may be substituted for the values given by the above rule.

average value taken shall in no case be less than 75 per cent or more than 125 per cent of the actual average of the two spans adjacent to the structure concerned.

A pole not individually meeting the transverse strength requirements will be permitted when reinforced by a stronger pole on either side if the average strength of the three poles meets the transverse strength requirements, and the weak pole has not less than 75 per cent of the required strength.

In the case, however, of crossings over railroads or signal lines other than those mentioned in Rules 405a and b the actual lengths of the two spans adjacent to the structures concerned, and the actual strengths of the crossing poles, shall be used.

504—Strength of Steel Poles and Towers and Other Metal Supports.

(a) *Loads and Limiting Stresses.* Steel supports, steel towers, and metal poles, together with their foundations, and guys when used, shall be so designed and constructed as to withstand the stresses due to the loads assumed in Rule 503. Under those loads the calculated stresses in the steel members and in the guys shall not exceed the following values, which are intended to be limiting unit stresses, not in excess of the yield point, beyond which the structure as a whole would be liable to failure.

Structural Steel:

Tension.....	27,000 pounds per square inch
Shear.....	24,000 pounds per square inch
Compression.....	27,000 - 90 L/r

Bolts, Rivets, Pins:

Shear.....	24,000 pounds per square inch
Bearing.....	48,000 pounds per square inch
Bending.....	36,000 pounds per square inch
Guy.....	One-half the ultimate strength

NOTE: These values for structural steel are for material having an ultimate tensile strength between 55,000 and 65,000 pounds per square inch and a yield point not less than 50 per cent of the ultimate strength.

For transverse strength in grade A construction heavy loading consists of a horizontal wind pressure of 12 pounds per square foot of projected area and a half-inch of ice. Since the stress in the steel does not exceed one-half the ultimate strength under these conditions, this is equivalent to a factor of safety of 3, based on an 8-pound wind pressure and the ultimate strength of the steel.

(b) *Guys.* The use of guys to obtain compliance with these requirements is regarded as generally undesirable. When guys are used, the steel supports or towers unless capable of considerable deflection shall be regarded as taking all of the stress in the direction in which the guy acts, up to their safe working load, and the guys shall have sufficient strength to take the remainder of the assumed maximum stress.

(c) *Minimum Strength.* Steel towers shall have a minimum strength sufficient if all conductors are removed to withstand a transverse pressure double that designated for grade A construction.

(d) *Foundations.* Steel towers or poles should preferably be placed on concrete or other suitable foundations extending above the ground line. If, however, the steel is set in earth, it shall be suitably protected against corrosion at and below the ground line.

(e) *Tests.* Unless sample structures are tested, or similar structures have been tested, to assure the compliance of structures in any line with these requirements, it is recommended that structures be designed to have a computed strength at least 10 per cent greater than that required by the rule.

(f) *Anchor Towers.* When steel supports or towers are used which are not capable of withstanding approximately as great a stress longitudinally as transversely, anchor towers shall be placed, at intervals not greater than 10 spans, which shall be able to withstand the combined longitudinal tension of all conductors up to 10,000 pounds plus one-half the excess above 10,000 pounds.

(g) *Thickness of Steel.* Steel poles or towers of grades A, B, and C shall have no less thickness of metal in members than the following:

Legs, galvanised	3/16 inch
Other members galvanised.....	1/8 inch
Legs, painted	1/4 inch
Other members painted.....	3/16 inch

Such steel poles or towers, including footings, shall be so constructed that all parts are accessible for inspection, cleaning, and painting, and that pockets are not formed in which water can collect. The ratio of L , the unsupported length of a compression member, to r , the least radius of gyration of the member, should generally not be greater than 150 for legs and 200 for other members having figured stresses.

The straight line formula given under (a) above for the 'allowable stress in compression automatically limits the stresses in steel members to safe values even though the ratio L/r is greater than the values given above. In other words, for larger values of L/r , due to increasing L , the value of the stress is reduced so much that no hazard can result.

(h) *Protective Covering or Treatment.* All iron or steel poles, towers, or supporting structures, and all hardware, including bolts, washers, guys, anchor rods, and similar parts of material subject to corrosion under the prevailing conditions, shall be protected by galvanizing, painting, or other treatment, which will effectively retard corrosion.

505—Strength of Wood or Concrete Supports.

(a) *New Poles.* Wood and reinforced concrete poles and their foundations and guys (when used) shall, when installed, be of such material and dimensions as will withstand the loads assumed in 503, without the stresses under these loads exceeding 50 per cent of the assumed ultimate strengths of the materials.*

NOTE: For transverse strength in grade A construction, heavy loading consists of a horizontal wind pressure of 12 pounds per square foot of projected area and a half-inch of ice. Since the stress in the wood does not exceed one-half the ultimate strength under these conditions, this is equivalent to a factor of safety of 3, based on an 8-pound wind pressure and the ultimate strength of the pole.

(b) *Maintenance.* Wood poles shall be replaced or reinforced when their strength has decreased to two-thirds that required by (a) above for new installations for grades A and B construction, and to one-half for grade C construction.

(c) *Selected Poles.* With lines carried on specially selected "clear" wood poles, having top circumferences not less than 24 inches for grades A and B, and 22 inches for grade C, and having ground-line circumferences not less than listed for class A if grade A or B, or for class B if grade C (see table, Appendix B), where the poles are syste-

*For method of computing strength of construction, see Appendix B.

matically inspected and maintained by treatment, repairs or replacement to not less than two-thirds of their required strength when new for grades A and B, and to not less than one-half for grade C, two-thirds of the calculated moment due to wind pressure shall be used in finding the stresses in the poles (except for crossings over railroads and signal lines other than those mentioned in Rules 405a and b), this moment being calculated from the assumed ice and wind pressure for the given grade and loading district and the average span length obtained as explained in Rule 503b.

(d) *Guys*. When guys are used to meet the strength requirements for wood or concrete poles, they shall be considered as taking the entire stresses in the direction in which they act, the poles acting merely as struts.

(e) *Minimum Pole Sizes*. Wood poles in grades A, B, and C construction shall be of selected timber, free from defects that would decrease their strength and durability and shall have no less nominal top diameters than 6 inches, except that for grade A, heavy and medium loading, a minimum of 7 inches is required.*

506—Strength of Crossarms and Conductor Fastenings.

(a) Crossarms of Selected Yellow Pine or Fir.*

	For Grades A and B	For Grade C ^b
2 or 4 pin.....	3 x 4 in.	2½ x 3½ in.
6 or 8 pin.....	3½ x 4½ in.	3 x 4 in.

*If of other material they shall have at least equal strength.

^bGrade C signal-line crossarms may be 2½ x 3½ inches for 6 pins, and 3 x 4 inches for 10 pins.

(b) *Crossarm Strength*. Crossarms for grades A, B, and C construction shall, when installed, withstand the vertical loads specified in Rule 503 without the stress under these loads exceeding 50 per cent of the assumed ultimate strength of the material. They shall also withstand any unbalanced longitudinal stresses, to which they are exposed with a limit of unbalanced tension where conductor pulls are normally balanced, of 700 pounds at the outer pin.

(c) *Bracing*. Crossarms shall be securely supported, by bracing if necessary, so as to safely support all other loads to which they may be subjected in use, including linemen working on them. Any crossarm or buckarm except the top one shall be capable of supporting a vertical load of 225 pounds at either extremity in addition to the weight of the loaded conductors. In general, they should be maintained at right angles to the axis of pole and to the direction of the attached conductors, and at crossovers should be attached to that face of the structure away from the crossing, unless special bracing or double crossarms are used.

NOTE: Double crossarms are generally used at crossings, unbalanced corners, and dead ends in order to permit conductor fastenings at two insulators, and so prevent slipping, although single crossarms might provide sufficient strength. To secure extra strength, double crossarms are frequently used, and crossarm guys are sometimes used.

(d) *Pins and Conductor Fastenings*. Pins, ties, and other conductor fastenings for grades A, B, and C construction shall have sufficient

*See Appendix B for data for computing transverse and longitudinal strength required for line supports and illustrative applications of the same.

strength to withstand the unbalanced tension in the conductor, up to a limit of 700 pounds per pin or fastening.

NOTE: Tie wires or fastenings shall have no sharp edges or burrs at contacts with the conductors.

(c) *Height of Pin.* The height of the pin and of the conductor fastenings and the material and cross section of the pin should be so chosen as to afford the required strength.

The method of attaching conductors by suitable ties to single pin-type insulators mounted on 1½ by 9-in. wood pins of locust or equivalent wood will usually provide strength up to 1,000 pounds conductor tension with the conductor 3.5 inches above the crossarm. Suitable steel pins afford greater strength both for the pins and for the cross-arms.

507—Conductors—Material, Minimum Sizes and Sags.

(a) *Materials.* All conductors of grades A, B, or C, construction shall be of copper, aluminum (with or without steel reinforcement), copper-covered steel, galvanized steel or other material which will not corrode excessively under the prevailing conditions.

(b) *Minimum Sizes.* Supply wires shall not be smaller than indicated in the following table, except that longer spans may be used with any listed conductor size if the separations and clearances given in Section III and the sags given in Appendix A are correspondingly increased:

TABLE 10
Minimum Allowable Conductor Sizes

(See Section IV for application of Grades of Construction and Rule 507b.)

	Loading District	Grade	Limiting span length in feet				
			150	175	200	250	300
Copper Wire Soft- Drawn	Heavy	A & B	6	4	4	--	2
		C	8	6	4	--	2
		A	8	4	4	--	2
	Medium	B	8	6	4	--	2
		C	8	6	4	--	2
		A	8	6	4	--	2
	Light	B	8	6	6	--	2
		C	8	6	6	--	2
		A	8	6	6	--	2
	Heavy	A	4	2	1	--	--
		B	4	2	2	--	--
		C	6	2	2	--	--
Medium- or Hard-Drawn Bare Copper Wires	Medium	A & B	4	4	2	1	--
		C	6	4	2	1	--
		A	6	4	2	1	--
	Light	A, B & C	6	4	4	2	1

Loading District	Grade	Limiting span length in feet						
		150	175	200	300	400	500	700
Heavy	A & B	6	4	4	4	2	2	--
	C	8	6	4	4	2	2	--
	A	6	6	4	4	4	2	00
Medium	B & C	8	6	4	4	4	2	00
	A	6	6	6	4	4	4	2
Light	B & C	8	8	6	4	4	4	2
	A	6	6	6	4	4	4	2

Steel Wires

Loading District	Grade	Spans 175 feet or less	Spans over 175 feet
All	A & B	6	4
All	C	8	6

Aluminum Wires in Urban Districts

Loading District	Grade	Spans 150 feet or less	Spans over 150 feet
All	A & B	11	0
	C	6 Steel reinforced	4 Steel reinforced

NOTE: For sizes and material requirements of supply-service leads, see Rule 210. Lightning-protection wires shall be regarded, in respect to size, material, and stringing requirements, as supply conductors with which they are associated.

(c) *Sags and Maximum Tension.* In grades A, B, and C construction, conductors of hard-, medium-, and soft-drawn copper shall have normal sags at 60°F. and no wind as nearly as practicable to those given in Tables 19, 20, and 21 of Appendix A.

Less sags than those listed may be used if pins, fastenings, cross-arms, and poles of sufficient strength to withstand the corresponding increase in longitudinal stresses are used, but sags shall not be so decreased from the tabulated values that, under the maximum assumed loading for the district, the tension will exceed 50 per cent of the breaking strength of the conductor concerned for grades A and B construction, and 60 per cent for grade C construction.

These sags given in the table are based upon experience and are designed to give the best results from the standpoint of safety and continuity of service.

(d) *Sag Limits.* In order to minimize danger from wires swinging together and to permit the moderate pin spacings and crossarm spacings sanctioned by modern good practice in overhead line construction, it is necessary to assign a limit to the sag, and hence to the recommended length of span of the smaller-sized wires, as indicated by the blank spaces in the tables. Longer spans may, however, be used with any listed conductor size if separations and clearances (Section III), and the sags given in Appendix A are correspondingly increased.

It is recommended that medium hard-drawn copper wire be used instead of soft in new construction, especially for sizes smaller than No. 2.

Soft copper wire has a yield point less than one-half that of medium-drawn copper, and hence stretches permanently with a correspondingly lighter loading of ice and wind.

(e) *Taking up Slack.* Slack should be taken up when, because of the permanent elongation of the wire or movement of supporting structures, the initial sags have so increased that the clearances or separations of conductors are materially below the requirements of the rules. As soft copper stretches much more than medium or hard, the taking up of slack will be necessary chiefly in lines where soft wire is used.

508—*Line Insulators for Grades A and B.*

(a) *High-Voltage Insulators.* Insulators for operation on supply lines at voltages exceeding 7,500 shall be of porcelain or other material which will give equally good results, mechanically and electrically, durable, and should be marked by the makers with a classification number and maker's name or trademark, the marks being so applied as not to reduce the electrical or mechanical strength of the insulator.

(b) *Strain Insulators.* Where strain insulators are used they shall be capable of withstanding without puncture under the normal mechanical stress at least as high a voltage as other insulators on the same line.

(c) *Insulators at Grounded Structures.* Wherever wood pins and crossarms or other ungrounded supports are used within five spans of a crossing span with line conductors there attached to grounded metal pins, grounded crossarms, steel bridges, steel towers, or other grounded structures, the insulators at the grounded supports shall be capable of

withstanding without flashover a voltage 50 per cent higher than those used at adjacent ungrounded supports.

NOTE: Where the supporting structures for the crossing span are the same as for other parts of the line, the insulators used may also be the same.

The above may be met by installing insulators within five spans which will withstand a flashover voltage of only two-thirds of the voltage which those at the grounded structure will stand, provided the other requirements of this rule are still met.

(d) *Flashover Voltages.* Insulators to which are attached conductors should be so designed that their dry flashover voltage is not more than 75 per cent of their puncture voltage at a frequency of 60 cycles per second, and shall be capable of withstanding without flashover at the frequency of 60 cycles the voltages shown in the following table:

Voltage of Circuit	Flashover Voltage	
	Dry	Wet
750.....	5,000	3,500
2,300.....	11,000	8,000
4,000.....	17,000	13,000
6,600.....	27,000	20,000
7,500.....	30,000	22,000
11,000.....	40,000	30,000
22,000.....	75,000	55,000
33,000.....	105,000	75,000
44,000.....	135,000	95,000
55,000.....	160,000	115,000
66,000.....	185,000	135,000
88,000.....	235,000	170,000
110,000.....	285,000	200,000
150,000.....	375,000	235,000
200,000.....	490,000	250,000

NOTE: By the term "wet" is meant a condition equivalent to a precipitation of one-fifth inch of rain per minute at an angle of 45 degrees to the axis of the insulator.

(e) *Factory Tests.* Each completed pin-type insulator for line voltages over 15,000 and each completed suspension insulator disk, shall be subjected to a routine factory test at dry flashover voltage for five minutes at a frequency of 60 cycles per second, or any other test which may be generally sanctioned by good modern practice.

(f) *Protection Against Burning.* In installing the insulators and conductors precautions shall be taken to guard against the possibility of arcs or leakage current injuring conductors or burning any wooden parts of the supporting structure which would render the conductors liable to fall.

509—Special Transverse Strength Requirements.

(a) *Alternate Construction in Special Cases* (See Figure 36.) In the case of structures of grades A, B, or C construction where, because of very heavy or numerous conductors or relatively long spans, the transverse strength requirements of this section cannot be met except by the use of side guys or special structures, and it is physically impracticable to employ side guys, the transverse strength requirements may be met by side-guying the line at each side of and as near as practicable to the crossing or other transversely weak structure, and with a distance between such side-guyed structures of not over 800 feet, provided:

1. The side-guyed structures for each such section of 800 feet

or less shall be constructed to withstand the calculated transverse load due to wind on the supports and ice-covered conductors, on the entire section between the side-guyed structures.

2. The line between such side-guyed structures shall be substantially in a straight line, and the average length of span between the side-guyed structures shall not be in excess of 150 feet.

3. The entire section between the transversely strong structures shall comply with the highest grade of construction concerned in the given section, except as to the transverse strength of the intermediate poles or towers.

(b) *Strength of Crossarms and Pins.* The crossarms, insulator pins, and conductor fastenings connected to the structure at each end of the transversely weak section shall be such as to withstand, under the conditions of loading prescribed in Rule 502, an unbalanced load equivalent to the combined pull in the direction of the transversely weak section of all the conductors supported up to 10,000 pounds for grade C, plus one-half the excess for grade A, or plus one-fourth the excess for grade B.

NOTE: If the unbalanced tension in any conductor does not exceed 1,000 pounds, the necessary strength will usually be provided by the use of single wood pins; and, if the tension does not exceed 2,000 pounds, by the use of double wood pins, provided the lever arm of the pin does not exceed 3.5 inches. (See Appendix A for tensions.)

510—*Special Longitudinal Strength Requirements for Sections of Grades A and B Construction in Lines of a Lower Grade of Construction (or Adjacent to Angles or Dead Ends).*

(a) *Required Strength.* The supporting structures (including poles, towers, crossarms, insulator pins, and conductor fastenings) for the ends of the higher grade section of the line shall be constructed to withstand without failure under the conditions of loading prescribed in Rule 502, a longitudinal stress equivalent, except as noted in (d), to the combined pull in the direction of this section of all conductors and wires supported, the pull of each conductor or wire being taken as the tension therein due to the prescribed loading. Where it is difficult to increase the longitudinal strength, the longitudinal stresses shall be reduced by increasing the conductor sags.

(b) *Flexible Supports.* When supports of the section of higher grade are capable of considerable deflection in the direction of the line, as with wood or concrete poles, or some types of metal poles and towers, it may be necessary to increase the normal clearances specified in Rule 704, or to provide head guys or special reinforcement to prevent such deflection. So-called flexible steel towers or frames, if used at such locations, shall be adequately reinforced to meet the requirements of (a) above.

(c) *Methods of Providing Strength* (See Figure 36.) The requirements of (a) are usually met by placing supporting structures of the required longitudinal strength at either end of the higher grade section of the line.

Where this is impracticable the supporting structures of the required longitudinal strength may be located one or more span lengths away

from the section of higher grade, within 500 feet on either side and with not more than 800 feet between the longitudinally strong structures, provided such structures and the line between them meet the requirements, as to transverse strength and stringing of conductors, of the highest grade occurring in the section, and provided that the line between the longitudinally strong structures is approximately straight or suitably guyed.

(d) *Modified Strength Requirement for Heavy Lines.* In cases where the line is approximately straight on both sides of the section of higher grade and in line with it, the strength of each pole or each crossarm shall be such as to withstand the combined stress in the conductors up to 10,000 pounds combined pull, plus one-half the excess above 10,000 pounds for grade A, and plus one-fourth the excess for grade B, if the line on one or both sides of the special construction should fail. In cases where, due to change of direction of the line or because of dead ends, the longitudinal stresses in the conductors of the stronger section are not even normally balanced by the conductors of the line beyond this construction, the construction shall be such as to withstand the total stress.

Where the crossing span at a section of higher grade is not in line with the line beyond this section, suitable guys shall be placed to withstand the resulting transverse stresses.

SECTION VI

REQUIREMENTS FOR SUPPLY LINES, INCLUDING ELECTRIC RAILWAY FEEDERS

601—Compliance with Other Rules.

<i>Construction or Voltage Classification</i>	<i>Other rules to be observed</i>
(a) 1. Grade A, B, or C. All districts where definite grades are required.....	Sections II, III, and IV
2. The crossings over railways, signal lines, or joint poles	Sections VI and VII
(b) Special longitudinal strength requirements, crossings of supply lines below 7,500 volts and over supply lines above 7,500 volts.....	510
(c) Dead ends in urban districts or changes in direction of line, for longitudinal strength.....	510
(d) Clearances of conductors and wires above roadways, railways, and footways, and from conductors and wires	301a and b, 608 and 609

602—Supply Lines in Urban Districts.

<i>Construction or Voltage Classification</i>	<i>Other rules to be observed, or required construction</i>
(a) Below 750 volts, above, crossing over, conflicting with, on joint poles with other lines below 750 volts.....	Sections II and III
If the voltage of the lower line is over 750 volts both lines shall be.....	Grade C
If over 7,500 volts construction shall be.....	Grade B
(b) Lines between 750 and 7,500 volts, alone, crossing over, conflicting with, or above on joint poles with, other lines not over 7,500 volts.....	Grade C
If the lower supply lines in (b) have a voltage over 7,500	Grade B
(c) All supply lines over 7,500 volts under all conditions....	Grade B

603—Supply Lines in Rural Districts.

<i>Construction or Voltage Classification</i>	<i>Rules to be observed, or required construction</i>
(a) Any supply line not concerned in crossings, conflicts, or joint poles except as in b, below.....	Rule 507, and Sections II and III.
(b) Upper line when involved in crossings, conflicts with, or joint poles, between lines above 7,500 volts and below 750 volts.....	only Grade C

604—Constant-Current Lines.

Where supply lines only are concerned, constant-current lines are included with constant-potential lines and graded by the nominal full-load voltage of the circuit concerned.

605—Common Use of Poles by Different Supply Lines.

(a) *Relative Levels.* Poles or towers used in common by supply lines of different voltage classifications, including trolley feeders, whether owned by the same or different utilities, shall have all supply lines arranged as to relative levels, separations, and clearances according to the requirements of Section III.

(b) *Relative Levels of Wires of Different Utilities.* Where poles are used in common by separately owned utilities, each of which may have supply conductors of different voltages on the same pole, supply conductors of a lower voltage of one utility may be placed at a higher level than those of a higher voltage of another utility in order to admit of keeping each utility's supply conductors in adjacent positions on the pole, provided that either (1) conductors of a lower voltage classification shall never be at a higher level than those of a higher classification, unless on the opposite side of the pole, or (2) that a vertical spacing not less than 4 feet is maintained between the nearest line conductors of the respective utilities, and this spacing be identified (if necessary) as a division space.

(c) *Grade of Construction.* Poles or towers used in common by supply lines, as noted in (a), shall have the grade of construction determined by Section IV for the highest voltage lines carried on such pole or tower, all conductors of all voltages being included in the computations of stresses on the pole or tower.

The crossarms, pins, and fastenings of conductors on poles or towers used in common by supply lines, as noted in (a), shall have the grade of construction determined by Section IV for the lines carried by cross-arm, pin, or fastening in question, according to their relation to other lines carried on the pole or tower.

(d) *Conductor Size and Sag.* The size and initial sag of each conductor shall be determined by its own voltage and the grade of construction required for it, according to its relation to other conductors carried on the pole or tower.

The different conductors on a commonly used pole may therefore be subject to different grades of construction requirements, the grade necessary for any crossarm or pole being the highest required for any conductor carried, by Section IV.

(e) *Trolley Wires.* Where a trolley-contact conductor is supported on a commonly used pole, it shall be included in the computation of transverse stresses on the structure.

606—Electric Railway Feeders and Contact Conductors.

(a) *Trolley Feeders as Supply Lines.* Except where specifically exempted in these rules (as for clearances and elevation in rules for common use of poles in this section and in Section IX) trolley feeders shall be considered and constructed in all respects as supply lines of equal voltage.

(b) *Third Rails.* Third rails shall be protected where not on fenced

right of way by overlapping guards composed of wood or other suitable material.

(c) *Trolley-Contact Conductor Supports.* All overhead trolley-contact conductors shall be so supported and arranged that the breaking of a single conductor fastening will not allow the trolley conductor or live span wire or current-carrying connections to come within 10 feet from the ground or from any platform accessible to the general public. (See Rule 204g.)

(d) *High-Voltage Contact Conductors.* Above 1,500 volts in urban districts (where not on fenced rights of way) the trolley-contact conductor shall be so suspended that if broken at a single point it cannot fall within 12 feet from the ground or any platform accessible to the general public.

(e) *Supply Lines Over Trolley-Contact Conductors.* Supply conductors carried over trolley-contact conductors shall conform to the same requirements as where crossing over supply lines of equal voltage in all districts.

607—*Electric Railway Construction.*

(a) *Assuring Against Loss of Power at Railway Crossings.* Unless electrical-railroad systems are protected by interlocking derails or gates at grade crossings with interurban or other heavy or high-speed railroad systems, the trolley-contact conductors shall either be arranged with live trolley guards of suitable construction, or shall be at the same elevation above their own tracks throughout the crossing and next adjoining spans, with catenary construction for crossing spans exceeding 100 feet.

(b) *Guards Under Bridges.* Where passing under steel bridges that are not sufficiently elevated to prevent a trolley pole from making contact with the bridge in case it leaves the contact conductor, a substantial inverted trough or other guard of insulating material shall be so installed as to prevent the trolley pole from making an electrical connection between the contact conductor and the bridge structure. (See Rule 310e.)

(c) *Construction at Railway Crossings.* Trolley-contact conductors and feeders and their supporting structures where crossing over railways shall conform to the strength requirements specified for supply lines under Rule 701.

The clearance of trolley-construction supports from the rails of railways crossed over shall comply with the requirements for supply-line supports under Rule 703.

608—*Strength of Construction in Urban Districts Generally.*

Trolley-contact conductors, feeders, and their supports, in urban districts, shall comply with the strength requirements for supply lines of equal voltage. Direct-current circuits of over 750 volts to ground where at higher levels and crossing over, conflicting with, or higher than and having joint poles with, signal lines shall comply with requirements of grade A (see notes under Rule 405 for special cases).

609—*Wire Clearances Above Railways, Roadways, and Footways.*

The clear space between the lowest overhead trolley-contact conductor

or feeder, or guy, span, or messenger wire and the surfaces of rails, streets, highways, or alleys over which the former passes shall not be less than the following at 60°F. with no wind: (See Rule 301.)

(1) Above track rails of electric and other railways where brakemen are permitted on top of cars:

	Feet
Trolley-contact conductors	22
Trolley feeders paralleling the contact conductors on the same street or highway	25

Where 21 feet has been established in any community instead of 22 feet for trolley-contact clearance, this may be continued, if carefully maintained.

(2) Above streets or alleys, roadways, or footways, including track rails of railways where brakemen are not permitted on top of cars, the trolley-contact conductors, when not over 1,500 volts to ground, shall have a minimum clearance of 16 feet, and when above 1,500 volts to ground shall have a minimum clearance of 18 feet.

This clearance is the minimum clear height in the middle of the contact-conductor span. The point of support at the pole structures should be not less than 2 feet higher, thus allowing for maximum sag in span wire and trolley-contact conductor at 60°F.

(3) Where subways, tunnels, or bridges require it, a less clearance of contact conductor above ground may be used locally, and the trolley-contact conductor should be very gradually graded from the regular construction down to the reduced elevation.

610—Clearances of Contact Conductors from Other Wires at Crossings.

The clear space between the trolley-conductor and the lowest overhead conductor or wire crossing above shall not be less than the following at 60°F. with no wind:

	Feet
Signal lines	4
Supply lines, 0 to 750 volts.....	4
Supply lines, 750 to 7,500 volts.....	6
Supply lines, 7,500 to 50,000.....	6
Guy, span, and messenger wires and service loops.....	4
If trolley-contact conductor is above 750 volts, no conductor should cross at less than.....	6
Unless the crossover conductors are beyond the reach of a trolley pole leaving the contact conductor or are suitably protected against damage from a trolley pole leaving the contact conductor, the clearance for trolley-contact conductors below 750 volts should be not less than.....	6

Trolley feeders are exempt from a clearance requirement from contact conductors at the same nominal potential and of the same system.

For clearance increases, see Rule 301.

SECTION VII

CROSSINGS OF SUPPLY LINES OVER RAILWAYS

701—Grades of Construction.

Overhead supply lines (or signal lines which have taken on the character of supply lines) crossing over railways shall comply with the construction requirements of grade A, except when over sidings, spurs, branches, or other minor tracks only, in which case they shall comply with the construction requirements of grade B. (See Rule 404.)

702—Compliance with Other Rules.

Such overhead supply lines shall comply as to conductor sizes, material and sags and as to materials, sizes and strength of supporting structures and attachments with the requirements of Section V, as to separation, clearances and relative levels of conductors and wires on the line itself, with the requirements of Section III as to guys and their insulators, with the requirements of 203 and 204, and in general with the requirements of Sections II and IV.

703—Pole Clearance to Rail.

Poles or towers supporting the crossover spans of overhead supply lines over railways shall, unless physical conditions or municipal requirements prevent, have side clearance not less than 12 feet from the nearest track rail, except that at sidings a clearance not less than 7 feet may be allowed. At loading sidings sufficient space shall be left for a driveway.

If overhead lines of the railway are crossed over, the pole or tower structures of each line concerned in the crossover shall have clearances from the conductors of the other line as required by Rule 302 or 308a.

704—Wire Clearance Above Rail (See Rule 301a, where the same requirements are given in tabular form).

The clear space between the lowest overhead supply line conductor or wire and the heads of rails above which the former cross shall not be less than the following at 60°F. with no wind, where the conductor or wire has fixed supports and the span does not exceed 150 feet :

(a) *Clearances Where Men Are Permitted on Cars.* Above track rails of railways handling standard freight cars where brakemen are permitted on top :

- (1) Supply lines of less than 750 volts overhead ground wires and their guy, messenger, and span wires, 25 feet.
- (2) Supply lines, 750 volts up to 15,000 volts, 28 feet. This may be reduced to 25 feet where lines are paralleled by trolley-contact conductors on same street or highway.
- (3) Supply lines, 15,000 to 50,000 volts, 30 feet. For conductors above 50,000 volts the given clearance shall be increased at the rate of 0.5 inch per 1,000 volts excess.
- (4) Trolley-contact conductors, 22 feet. In communities where 21 feet has been established, this clearance may be continued if carefully maintained. The elevation of the contact conductor should be the same in the crossing and next adjacent spans.

(b) *Clearances Where Men Are Not Permitted on Cars.* Above track rails of electric and other railways, where brakemen are not permitted on top of cars, the clearances shall be at least 18, 20, 24, and 16 feet respectively, in the four cases given above.

The given trolley clearance (16 feet) is the minimum clear height in the middle of the trolley-conductor span, and the point of support at the pole structure should be at a height of not less than 18 feet above the track rail, thus allowing 2 feet for the total maximum sag at 60°F. in span wire and trolley-contact conductor.

(c) *Increased Clearance for (a) and (b).* The clearances of (a) and (b) apply to spans not exceeding 150 feet. (See Rule 301a, "Increased Clearances.")

705—Crossover Wire Clearances to Railway Wires (See Rule 301b, where the same requirements are given in tabular form).**(1) Above signal conductors (of railways) :**

	Feet
Supply lines, 0 to 750 volts.....	4
This may be reduced to 2 feet if the crossing is not within 6 feet of any pole concerned in the crossing and the voltage is not over 300 volts.	
Supply lines, 750 to 7,500 volts.....	4
Supply lines, 7,500 to 50,000 volts.....	6
Service supply connections.....	2
Guy, messenger and span wires.....	2

(2) Above supply conductors (over 400 volts to ground and supplying railway signal system) :

	Feet
Supply lines, 0 to 750 volts.....	2
Supply lines, 750 to 7,500 volts.....	2
Supply lines, 7,500 to 50,000 volts.....	4
Guy, messenger, and span wires.....	4

706—Increase of Clearances in Special Cases.

(a) *Clearance Increase for Long Spans.* The clearances of Rule 705 shall be increased in accordance with 301b, "Increased Clearances."

(b) *Clearance Increase for High Voltage.* The clearance of Rule 705 shall be increased, where the supply line voltage exceeds 50,000 volts, by 0.5 inch per 1,000 volts of the excess.

(c) *Clearance Increase for Suspension Insulators.* The initial clearances, where the upper line at a grade A or B crossing over track rails or signal lines is supported by suspension insulators, shall be sufficient to prevent the minimum clearances of Rules 704 and 705 from being reduced through the breaking of a conductor in either adjoining span by more than 10 per cent over rails or by more than 25 per cent over conductors or wires. (See Rule 301b, "Increased Clearances," 3 and 4.)

707—Protection Against Conductor Breakage.

(a) *Splices and Taps* (See Figure 37). Splices shall not be made in the crossing span and preferably not in the adjacent spans, which are depended upon for withstanding the longitudinal stress of the crossing conductors. If a splice or tap is made in any conductor in the span next to the crossover span, it shall, where practicable, be placed at a point nearer to the crossover support than is the nearest conductor crossed over.

(c) *Falling Trees.* The crossing span and the next adjoining spans, so far as practicable, shall be kept free from overhanging or decayed trees, which might fall into the line.

708—Insulators.

At railway crossings insulators shall be employed capable of withstanding a flashover voltage 25 per cent higher than those used in the remainder of the line.

709—Underground Lines Crossing Under Railways.

Underground supply lines crossing railways shall comply with the requirements of Section X.

SECTION VIII**CROSSINGS, CONFLICTS AND JOINT USE OF POLES BY SUPPLY LINES
WITH SIGNAL LINES****801—Special Requirements and Compliance with Other Rules.**

(a) *Grade of Construction.* Overhead supply lines crossing over signal lines under the circumstances noted in Rule 405, shall comply with grades of construction A, B, or C, as noted in the rule referred to.

(b) *Compliance with Other Rules.* Such overhead supply lines shall comply as to conductor sizes, materials, sags, and as to materials, sizes, and strength of supporting structures and attachments with Section V, as to separations and clearances of conductors and wires of the supply line itself with the requirements of Section III, as to guys and their insulators with the requirements of Rules 203 and 204.

(c) *Where Concerned with Other Overhead Lines or with Railways.* Such overhead supply lines, where also concerned at the crossover

within crossings, conflicts or common use of poles with other overhead lines in addition to the signal lines crossed over or with a railway crossing, shall comply also with the requirements of Rule 401, as to relative levels and with 402 to 406, as to character of construction and with other rules of this section which apply to these conditions.

(d) *Pole Clearance.* The pole or tower structures of each line concerned in the crossover shall have clearances from the conductors of the other line, as required by Rule 302 or 308, which ever applies.

(e) *Wire Clearance above Signal Wires.* The clear space between the lowest overhead supply line conductor or guy, messenger, or span wire, crossing over any signal-line conductor or guy, span or messenger wire (except for crossings between conductors and guy messenger, or span wires on the same pole, for which see Rule 302, shall not be less than given below, at 60°F. with no wind where the upper conductor or wire has fixed supports (pin or strain-type insulators), and the sum of the distances from the point of intersection to the nearest supporting structure of each span does not exceed 100 feet:

(1) Above signal conductors:	Feet
Supply lines, 0 to 750 volts.....	4
This may be reduced to 2 feet, if the crossing is not within 6 feet from any pole concerned in the crossing, and the voltage is not over 300 volts.	
Supply lines, 750 to 7,500 volts.....	4
Supply lines, 7,500 to 50,000 volts.....	6
Service-supply conductors.....	2
Guy, messenger, and span wires.....	2
(2) Above guys, span, or messenger wires (of signal lines):	
Supply lines, 0 to 750 volts.....	2
Supply lines, 750 to 50,000 volts.....	4
Guy, messenger, and span wires.....	2

(f) *Clearance Increases.* The increases of clearances for longer spans, higher voltages, and for suspension insulators shall be as given in Rule 301b.

(g) *Special Requirements.* Special longitudinal strength requirements are given in Rule 510. Requirements for protection against conductor breakage are given in Rule 707.

802—Supply Lines Conflicting with Signal Lines.

Where supply lines are at higher levels and conflict with signal lines, the requirements for the strength of construction of Rule 801 apply in general to the conflicting supply lines, just as they apply where the supply lines cross the same signal lines.

803—The Joint Use of Poles by Signal and Supply Lines—Supply Lines Above Signal Lines.

(a) *Avoidance of Conflict.* It is recommended that overhead lines which cannot readily be so separated from each other as not to conflict be placed on a single-joint pole line unless the high voltage of certain of the circuits, or the large number of conductors, makes the use of a single-pole line undesirable or impracticable. (See Rule 401d.)

The joint use of poles by signal lines and supply lines above 7,500 volts between conductors (or 4,400 volts to neutral or ground) is not recommended except where it is impracticable to separate the lines sufficiently to avoid conflicts.

Between 5,000 and 7,500 volts between conductors (or between 2,900

and 4,400 volts to neutral or ground) conditions in particular cases will determine whether or not the joint use of poles is permissible.

The general requirements of Sections II and III shall be complied with, except as modified in the following paragraphs:

(b) *Strength of Poles.* Poles used jointly by supply lines and signal lines with the supply lines above shall have the highest grade of construction specified in Rule 405, according to the voltage and character of the various lines carried by the pole.

Where the signal lines are used exclusively in the operation of supply lines the pole strength need not be that required above, but the lines shall occupy the same relative positions noted under (f) below.

(c) *Conductor Supports.* The strength of crossarms, pins, and fastenings shall conform to the highest grade of construction required for the lines carried by the particular crossarm concerned, according to Rule 405. This may sometimes be a lower grade than that required for the pole or tower by reason of other lines carried on higher crossarms.

(d) *Special Provision Regarding Transverse Pressure.* In calculating the transverse pressures upon poles carrying supply conductors above signal conductors, where no supply conductors are below signal conductors, and where the reduction in transverse moment given in Rule 505c is not used, the number of signal conductors upon which the transverse pressure is calculated shall be taken as only one-half their total number, provided that they are smaller than No. 8 Stl.W.G. if steel, or No. 6 A.W.G. if copper.

There are two reasons for this exception: (1) Signal conductors of small size and strung to small sags are more liable to break and relieve transverse pressure than are larger supply conductors so strung; (2) joint use of poles will be encouraged and thus hazards be avoided which would exist were two separate and frequently conflicting pole lines used to limit the number of wires.

(e) *Longitudinal Stresses.* In calculating the longitudinal stresses upon jointly used poles complying with grade A or B construction requirements where crossing over railways or over signal lines (where these crossings would of themselves require compliance with grade A or B construction of the crossover span to meet the special longitudinal requirements at such points) the tension in the signal conductors may be considered as limited to one-half their breaking strength provided they are smaller than No. 8 Stl.W.G. if of steel, or No. 6 A.W.G. if of copper, regardless of how small the initial sags of the signal conductors at 60°F.

(f) *Clearance and Separations and Relative Levels.* The clearances and separations of supply and signal conductors on jointly used poles, as well as the relative levels, are covered in detail in Rules 306 and 401. In general, signal lines for public use should be not less than 4 feet below supply lines.

Where signal lines are below supply lines the signal line requirements for grade A, B, or C, strength of their crossarms, pins, and fastenings are avoided.

The establishment of standardized levels in any given

community, as recommended by Section IV, facilitates the extension of lines and safety to the public and workers by permitting the desired relative levels and clearances to be readily obtained on jointly used poles as well as in crossings and conflicts.

804—The Joint Use of Poles by Signal and Supply Lines—Signal Lines above Supply Lines.

This relation of levels is not desirable, and should be avoided where practicable.

(a) *Strength Requirements.* Poles or towers used jointly by signal and supply lines, with the signal lines above the supply lines, shall comply with the requirements and rules referred to in Rule 803 as well as those in this rule.

(b) *No Reduction.* The grade of construction A or B where required for the signal lines, includes the size, material, and sag of conductors as well as the strength of structures required for supply lines of the same grade by Section V, with no reduction in transverse strength requirements such as is permitted by Rule 803d where supply lines are above signal lines.

(c) *Grade C Signal Conductors.* Signal conductors which are required to comply with grade C construction may be smaller than grade C supply conductors, but not smaller than given in the following table:

TABLE 12

<i>Span length and sag</i>	<i>Material</i>	<i>Size</i>
Spans not over 100 feet with sags not less than 5 inches, and spans over 100 feet but not over 125 feet with sags not less than 7 inches.	Hard copper.....	10
	Steel.....	12
Spans over 125 feet but not over 150 feet with sags not less than 10 inches.	Hard copper.....	9
	Steel.....	11
Spans over 150 feet with sags of grade C supply conductors or more, as given in Appendix A.	Hard copper or steel.....	Size of grade C, supply conductors, as given in Rule 807.

Paragraph 803d does not apply to such conductors.

In localities where the practice of placing conductors of signal circuits for public use above supply conductors has been generally established, minor extensions with the conductors in the same relative positions and with the clearances covered by the table may be made in either system, but these extensions should not continue beyond a location at which it becomes practicable to change to the arrangement standardized by these rules.

805—Special Crossing Construction.

(a) *Short Spans* (See Figure 38). In cases where the crossover span is constructed of such a height that its length is less than the distance between either point of support of its lowest conductor and the highest conductor of the line crossed, the requirements for conductor sags and for size and type of conductors in Section V, are waived, provided that a permanently grounded guardarm is installed at each crossover support in such a manner as to prevent conductors, which break in either adjacent span, from swinging back into the conductors of the span crossed over.

This character of construction is facilitated where the span crossed over is at a minimum elevation above ground level, and where the crossover supports can be placed quite near together.

(b) *Cradles*. Cradles are not recommended. It is believed better to build the supply line strong enough to withstand extreme conditions than to build a cradle of sufficient strength to catch and hold the supply line if it falls.

SECTION IX

SIGNAL LINES AT CROSSINGS AND USED ALONE

901—*Loading and Guying for Grade D*.

(a) *Conditions Determining Grade*. Signal lines crossing over railways, except in the cases mentioned in Rule 406, b, c, d, and e, are classed as grade D and shall have construction in accordance with the following requirements. Where also crossing over supply lines (or signal lines having the character of supply lines) in the same span the construction required shall comply either with grade D, grade E, Rule 905, or grade A or B, according to the voltage of the supply line (see Section IV):

Signal lines crossing over the supply lines covered in Rule 405, and also crossing over railways in the same span, should comply with grade D or E requirements for supporting structures; but grade C requirements apply to conductor sizes and sags in such cases. (See Rule 502.)

(b) *Transverse Guying*. The poles supporting the crossing span shall be side-guyed or braced to withstand the transverse load put upon them in accordance with the conditions specified in the two following paragraphs; except that if the poles are of such strength that the material will not be stressed beyond one-half its ultimate strength when the poles have deteriorated to 50 per cent of their original strength, the guys or braces may be omitted. The guys shall be considered as taking, in the direction in which they act, the horizontal component of the entire load, the poles acting as struts, resisting the vertical component. The calculated stresses in the guys shall not exceed one-half of the ultimate strength of the material.

(c) *Transverse Loading*. 1. Heavy Loading—In regions of heavy loading the assumed horizontal wind pressure at right angles to the direction of the line upon the poles and conductors shall be taken as 8 pounds per square foot of projected area on cylindrical surfaces. The pressure shall be computed upon the poles without ice covering, while the conductors shall be assumed to be covered with a layer of ice one-half inch in radial thickness. In computing the transverse pressure on conductors the actual number of conductors shall be used up to 10. For larger numbers of wires only two-thirds of the total number shall be counted, with a minimum of 10.

2. Medium and Light Loading—In regions of medium loading the transverse wind pressure shall be taken as two-thirds that for heavy loading. In regions of light loading the transverse wind pressure shall be taken as four-ninths that for heavy loading. See (g) below as to loading districts.

In calculating transverse load a cable with its supporting messenger shall be considered equivalent to the number of open wires obtained by multiplying the diameter of the cable in inches by 3.

(d) *Longitudinal Guying*. The poles supporting the crossing span shall be head-guyed away from the crossing so as to withstand the load

specified in the two following paragraphs; except that where there are not more than two wires in a crossing span and the poles are not required by (b), above, to have side guys, the head guys may be omitted, if the poles are of such strength that the material will not be stressed beyond its ultimate strength when the poles have deteriorated 50 per cent of their original strength. The guys shall be considered as taking, in the direction in which they act, the horizontal component of the entire load, the poles, acting as struts, resisting the vertical component. The calculated stresses in the guys shall not exceed the ultimate strength of the material.

(e) *Heavy Loading.* In regions of heavy loading the longitudinal load shall be assumed equivalent to an unbalanced pull in the direction of the crossing of all the conductors or wires supported, the pull of each conductor or wire being taken as one-half its ultimate strength. In any case where the total pull exceeds 10,000 pounds the load shall be taken as 10,000 pounds plus one-quarter the excess above 10,000 pounds.

(f) *Medium and Light Loading.* In regions of medium loading the longitudinal load shall be taken as two-thirds that for heavy loading. In regions of light loading the longitudinal load shall be taken as four-ninths that for heavy loading.

For head guying, cables are not included in the count of wires, since the messenger serves as a head guy.

(g) *Loading Map.* The loading map of the State of Nevada, Appendix D, sets forth the loading areas for this State.

(h) *Combined Effect of Ice and Wind.* The localities in the different groups are classified according to the relative prevalence of high-wind velocity and thickness of ice which accumulates on the wires, light loading being in general for places where little if any ice ever accumulates on wire. If high wind velocities are frequent in a given place, the loading for that place may be classed as heavy, even though ice does not accumulate to any greater extent than at some other place having less severe winds which has been classed as a medium-loading district.

(i) *Guy Leads.* Guy anchors shall, where possible, be located so that the horizontal distance from the ground line of the pole to the guy or guy rod will be not less than the height above ground of the attachment of the guy to the poles for head guys, and not less than one-third that height for side guys.

902—Poles, Crossarms, and Wires—Grade D.

(a) *Size of Pole and Setting.* Wood poles supporting the crossing span shall be of selected timber, sound and reasonably straight. Poles shall have dimensions not smaller than the values given in the tables of Appendix B when carrying the number of wires there designated.

The minimum dimensions given in this table correspond to poles designated by the wire-owning companies as class C where not more than 20 wires are carried; class B, where 20 to 40 wires are carried; class A, where more than 40 wires are carried.

Poles shall be set to such a depth and in such a manner and back-

filling shall be tamped so thoroughly that the applied load will break the pole before the butt is pulled loose in its setting. A table of recommended depths of setting is given in Appendix B.

(b) *Crossarms.* Wood crossarms supporting the crossing span shall be of yellow pine, fir, or other suitable timber and shall have a minimum section of $2\frac{3}{4}$ by $3\frac{3}{4}$ inches for 6-foot arms or shorter, and 3 by 4 inches for arms longer than 6 feet. Galvanized or painted iron or steel crossarms of equal strength may be used.

In rural districts in arid regions where the practice has been established of using $2\frac{3}{4}$ x $3\frac{3}{4}$ -inch arms in 8- and 10-pin lengths, this practice may be continued where conductors are not larger than No. 10.

Crossarms and insulators shall be double on the crossing poles. The crossarms shall be held together with properly fitted spacing blocks or bolts placed immediately adjoining the outside pins, and shall not support more than ten conductors. Brackets or racks may be used only if used in duplicate or otherwise designed so as to afford two points of support for each conductor, except that, for supporting twisted-pair wires, a single metal bracket, designed to safely withstand the full dead-end pull of the wires, may be used.

(c) *Pins, Insulators, and Tie Wires.* Insulator pins shall be of steel, wrought iron, malleable cast iron, or locust or equivalent wood. Wood pins shall be sound and straight-grained with a minimum diameter of shank of $1\frac{1}{4}$ inches and a maximum length of $8\frac{1}{4}$ inches. Steel or iron pins shall have a minimum diameter of shank of $\frac{1}{2}$ inch and a maximum length of $9\frac{1}{4}$ inches.

(d) *Conductors.* Conductors shall be of hard-drawn copper, copper-covered steel, galvanized steel, or other hard-drawn, corrosion-resisting metal; provided, however, that galvanized steel shall not be used in localities where excessive corrosion would result.

The minimum allowable sizes for conductors of the crossing span are given in the following table:

TABLE 13
Minimum Wire Sizes—Grade D

Conductor	Spans 125	
	feet or less	Spans over 125 feet up to 150 feet
Hard-drawn copper	10	9
Galvanized steel	10	8
Galvanized steel in rural districts of arid regions	12	10
Steel-reinforced aluminum	6	6

If spans in excess of 150 feet are necessary, the size of conductors specified above or the sags shall be correspondingly increased.

Conductors of material other than the above shall be of such size and so erected as to have a mechanical strength not less than that of the sizes of copper conductors given above.

The use of twisted-pair wires without a supporting messenger shall be eliminated as far as practicable. In no case shall this kind of wire be used in spans longer than 100 feet without a supporting messenger. Each wire or a twisted-pair not supported by a messenger shall be tinned hard-drawn copper not smaller than No. 14, or tinned copper-covered steel not smaller than No. 17.

Conductors of the crossing span shall be strung with sags not less than shown in the following table:

TABLE 14
Sags of Hard-Drawn Bare Copper Wire or Steel

Length of span, feet	Sag in inches		
	at 20°F.	at 60°F.	at 100°F.
80	2½	4½	8½
90	3½	5½	10
100	4½	7	12
110	5½	8½	14
120	6½	10	16
130	9	12	21
140	10	15	22
150	12	18	25

(e) *Messengers.* The following table gives the minimum sizes of galvanized-steel strand messenger cable to be used for supporting different sizes of cable:

TABLE 15
Minimum Sizes of Messenger Cable

Size of cable, pounds per foot	Messenger cable (nominal ultimate tensile strength)
Less than 2.25 pounds	6,000 pounds
2.25 to 5.0 pounds	10,000 pounds
Over 5.0 and under 8.5 pounds	16,000 pounds

For spans exceeding 150 feet or for heavier cables a proportionately larger messenger cable or other proportionately stronger means of support shall be used.

Multiple-wire cables and their messengers shall be suspended with a normal sag at 60°F. so that when they are subjected to the loading prescribed in Rule 901c, the stresses in the messenger cables will not exceed the following values:

TABLE 16
Messenger Cable

Nominal Ultimate Tensile Strength	Sag's Working Tensile Strength
6,000 pounds	3,500 pounds
10,000 pounds	5,900 pounds
16,000 pounds	9,500 pounds

903—Signal Line Clearances.

(a) The clear space between the lowest signal conductor, guy or messenger and the heads of rails shall, at 60°F. with no wind, be in general not less than 25 feet.

When signal conductors cross tracks not carrying traffic which involves brakemen riding on top of standard freight cars, the above clearance may be reduced to 18 feet.

When spans exceed 150 feet in length, additional clearance must be provided as given by Rule 301a.

(b) *Clearances from Other Wires.* The clear space between the lowest signal conductor, guy, or messenger and the highest wire of a similar nature paralleling the track shall be not less than 2 feet where the span is 100 feet or less. For longer spans and for crossings over supply wires, the requirements of Rule 301b must be met.

The vertical clearance between conductors supported on the same pole or structure and at different levels shall in no case be less than 12 inches and preferably 24 inches. (See also Rule 304.)

(c) *Pole Clearances.* Unless physical conditions or municipal requirements prevent, the side clearance of poles shall be not less than 12 feet from the nearest track rail, except at sidings where clearance of not less than 7 feet may be allowed. Where conductors of one pole line cross over or under conductors of a second line there shall, if practi-

cable, be not less than 3 feet clearance between the conductors of the first line and any pole or tower of the second line, unless the conductors are attached thereto.

904—*Relation of Crossing Span to Line.*

(a) *Span Length.* Poles should, where practicable, be so located that crossing and adjacent spans are in a straight line and free from exposure to overhanging or closely adjacent trees or inflammable material or structures. (See Rule 202.)

The crossing span shall be as short as practicable, and in general shall not be longer than the normal span of the line. No crossing span should exceed 125 feet in length if this can be avoided.

(b) *Vertical Displacement of Crossing Span.* The vertical distance from the top crossarm of a crossing pole to a straight line connecting the top crossarms of the next adjacent poles on either side of this crossing pole shall not exceed the values given in the following table:

<i>Average Length of Span, in feet</i>	<i>Allowable Vertical Distance, in feet</i>
Under 100	4
100 to 130	5
Over 130	6

(c) *Guying in Special Cases.* Where on account of physical conditions it is impracticable to guy or brace the crossing poles as specified in (b) and (c), the requirements there given may be met by head-guying and side-guying the line as near as practicable to the crossing, but at a distance not exceeding 500 feet from the nearest crossing pole, provided that the line is approximately straight and that a cable of strength equivalent to that of the head guy is run between the two guyed poles, being attached to the guyed poles at the point at which the head guys are attached, this cable being securely attached to every pole between the guyed poles.

Where the poles supporting the crossing span are not in line with the poles in the adjoining spans, additional guying shall be placed to take care of the increased stress.

(d) *Inspection.* All parts of the supporting structures of the crossing span shall be examined annually by the owner and all defective parts shall be promptly restored to a safe condition.

905—*Signal Lines Crossing Over Minor Tracks—Grade E.*

(a) *Grade.* Signal lines crossing above minor tracks (as described in Rule 406b) shall conform to the requirements for grade E. These requirements differ from those of grade D only as specified in (b), (c), and (d), below.

(b) *Transverse and Longitudinal Strength.* The transverse and longitudinal strength of crossing supports of grade E construction shall be equivalent to two-thirds of that required for grade D construction by Rule 901.

(c) *Size of Pole.* Poles shall have dimensions not smaller than the values given in the tables of Appendix B, when carrying the number of wires there designated. The minimum dimensions given in these tables correspond to poles designated by the wire-owning companies as class C where not more than 40 wires are carried; class B where more than 40 wires are carried.

(d) *Conductors.* The minimum allowable sizes for conductors of the crossing span shall be as follows:

TABLE 17
Minimum Wire Sizes—Grade E

<i>Conductor</i>	<i>Spans 125 feet or less</i>	<i>Spans over 125 feet up to 150 feet</i>
Hard-drawn copper in heavy-loading districts.....	10	10
Hard-drawn copper in medium- and light-loading districts.....	12	10
Galvanized steel.....	12	10
Steel-reinforced aluminum.....	6	6

If spans in excess of 150 feet are necessary, the size of conductors specified above or the sags shall be correspondingly increased.

Conductors of material other than the above shall be of such size and so erected as to have a mechanical strength not less than that of the sizes of copper conductors given above.

The use of twisted-pair wires without supporting messenger shall be confined to spans not exceeding 125 feet.

906—*Minimum Sizes of Grade C Signal Conductors.*

Signal conductors which are required to comply with grade C construction may be smaller than grade C supply conductors, but not smaller than given in the following table:

TABLE 18

<i>Span length and sag</i>	<i>Material</i>	<i>Size</i>
Spans not over 100 feet with sags not less than 5 inches, and spans over 100 feet but not over 125 feet, with sags not less than 7 inches.	Hard copper.....	10
	Steel.....	12
Spans over 125 feet but not over 150 feet with sags not less than 10 inches.	Hard copper.....	9
	Steel.....	11
Spans over 150 feet with sags of grade C supply conductors or more as given in Appendix A.	Hard copper or steel.....	Sizes of grade C supply conductors as given in Rule 507.

Paragraph 803d does not apply to such conductors.

907—*Signal Lines Crossing Over Trolley-Contact Conductors.*

(a) *Not Exceeding 750 Volts.* 1. Signal lines except twisted-pair conductors (see 2), and fire-alarm conductors (see 3), carried over trolley-contact conductors below 750 volts shall have conductor sizes as specified for grade C in Rule 507, and sags as specified for grade C in Appendix A, except that for crossings where grades D and E are not required, for spans not exceeding 100 feet No. 12 hard-drawn copper or steel is permitted with a sag of not less than 5 inches; for spans between 100 and 125 feet No. 10 is permitted with a sag not less than 7 inches, and for spans between 125 and 150 feet No. 9 is permitted with a sag not less than 10 inches.

Where the signal lines concerned cross over railways under circumstances requiring grade D or E construction for signal lines, the requirement of the above rule applies as to size and sag of conductors, while grade D or E applies to the supporting structures.

2. Twisted-pair conductors, unsupported by messengers, shall not be used in spans over 100 feet, if carried over trolley-contact conductors below 750 volts, unless each wire is hard-drawn copper not less than No. 14 or copper-covered steel not less than No. 17.

3. Fire-alarm conductors shall in no case be smaller than required for grade C signal lines by Rule 906, above.

4. The clearance of signal lines above contact conductors crossed over shall be in accordance with the values given in the table of Rule 301b.

(b) *Exceeding 750 Volts.* 1. For signal lines carried over trolley-contact conductors above 750 volts to ground, see Rule 406.

2. Twisted-pair conductors may be used under the restrictions given in (a)2, above, but if in A or B construction, they shall have sags not less than those required by Appendix A for No. 8 hard-drawn copper, and where supported by a messenger, the messenger shall have the sags required in Rule 902e. Where supply-line voltage exceeds 7,500 volts the twisted pair shall always be supported by a messenger.

3. The clearances of signal lines above the contact conductors crossed over shall be in accordance with the values given in the table of Rule 301b.

908—*Signal Lines Crossing Over or Conflicting with Supply Lines Above 750 Volts.* (Not recommended except over trolley feeders.)

(a) *Strength of Construction.* Overhead signal lines crossing over supply lines under the circumstances noted in Rule 405e shall comply with the construction requirements of grade A, B, or C as required in that rule. (See Rule 910 for signal lines used in the operation of supply lines.)

(b) *Compliance with Other Rules.* Where signal lines crossing over supply lines are required to comply with grade A, B, or C construction, they shall comply as to conductor sizes, materials, and sags and as to materials and strength of supporting structures and attachments with Section V; as to separation and clearances of conductors and wires of the signal lines themselves with the requirements of Section III; as to guys and their insulators with the requirements of Rules 203 and 204, and in general with the requirements of Section II.

(c) *Where Concerned Also with Railways.* Where the signal lines referred to in (a), above, are required to comply with grade C construction and also cross over railways under circumstances calling for compliance with grade D or E construction requirements for the signal lines, the requirement for grade C construction may be waived as to strength of supports, being replaced by those grades D or E, but grade C requirements apply as to size and sag of conductor. (See Rule 906.)

(d) *Pole Clearance.* The pole or tower structures of each line concerned in the crossover shall have clearances from the conductors of the other line as required by Rule 302 or 307, whichever applies.

(e) *Wire Clearance Above Supply Lines.* The clear space between the lowest overhead signal-line conductor (or guy, messenger, or span wire) crossing over any supply-line conductor or guy, span, or messenger wire* shall not be less than given below, at 60°F. with no wind, where the upper conductor or wire has fixed supports, and the sum of the distances from the point of intersection to the nearest supporting structure of each span, does not exceed 100 feet:

	Feet
Signal lines above supply conductors below 7,500 volts.....	4
Above supply conductors 7,500 to 50,000 volts.....	6
Above supply-service conductors.....	2
Above supply guy, messenger, and span wires.....	2
Guy, span, and messenger wires above supply conductors below 750 volts	2
Above supply conductors 750 to 7,500 volts.....	4
Above supply conductors 7,500 to 50,000 volts.....	6

*Except for crossings between conductors and guy, messenger or span wires on the same pole, for which see Rule 301b.

(f) *Clearance Increases.* Clearance increases for long spans and high voltages are given in Rule 301b.

(g) *Falling Trees.* The crossing span and the next adjoining spans, so far as practicable, shall be kept free from overhanging or decayed trees, which might fall into the line.

(h) *Special Longitudinal Requirements.* For special requirements for longitudinal strength of crossover supports of signal lines crossing over supply lines, where compliance with grade A or B is required for the signal lines, see Rule 510.

(i) *Special Short-Span Crossovers.* For special short-span crossing construction, see Rule 805.

(j) *Guys.* Guys may be used to meet the strength requirements of Section V and where used they and their insulators and guards shall conform to Rules 203 and 204.

(k) *Signal Lines Conflicting with Supply Lines.* Where signal lines are at higher levels and conflict with supply lines the requirements of (a) and (b), above, apply in general to the conflicting signal lines just as they apply where the signal lines cross over the same supply lines.

Clearances from the poles and conductors of a second line are given in Rule 308.

Requirements for guys are given in Rule 203.

909—*Signal Lines Alone or Concerned Only with Other Signal Lines.*

(a) *Fire-Alarm Lines.* Conductors used for fire-alarm circuits shall comply with the requirements of Rule 906 for grade C signal lines.

Where carried at higher levels than supply conductors in crossings, conflicts, or common use of poles, they shall comply with grade A, B, or C construction requirements according to Rule 405, (f) and (g), and note 2.

(b) *Other Signal Lines.* Conductors for signal lines other than fire-alarm lines unless crossing at higher levels or conflicting with, or on the same poles above supply (or trolley) lines, need not comply with any requirements as to size, material, or sag.

(c) *Supporting Structures for Signal Lines.* The poles used for other signal lines, unless exposed to supply (or trolley) lines by crossing above, conflicting with, or being carried above the supply lines on the same poles, need not comply with any requirements as to strength and material except that poles and crossarms shall be of such initial size, and so guyed or braced where necessary as to safely withstand the vertical loads to which they may be subjected, including linemen working on them.

In other respects all signal-line supports shall comply with the general requirements of Section II covering traffic guards, pole clearances, guys, and other matters.

(d) *Clearance Above Ground.* (See also Rule 301a). Signal conductors alone and their guys, span wires, and messengers shall have clearances above streets, highways, alleys, or generally accessible spaces across or along (and above) which the former pass, not less than the

following at 60°F. with no wind, when the spans do not exceed 150 feet.

<i>Signal Lines or guy, span, or messenger wires</i>	<i>Feet</i>
Above streets and other traveled roadways.....	18
Along roads in rural districts.....	15
Crossing above spaces or ways accessible only to pedestrians.....	10
Above roadways to residence garages.....	10

The clearances do not apply to guys not carried over roadways, or to guys along one side of a street or alley, unless over driveways. For guys on private right of way, or parallel to sidewalk curbs, when not passing over pathways or roadways, no clearance is required; and if passing over only pathways the clearance may be reduced to 8 feet.

For signal-line spans over 150 feet these clearances shall be increased at the rate of 1 inch for each 10 feet excess.

(e) *Clearances from Other Signal Lines* (see also Rule 301b). Signal conductors and their guy, span, or messenger lines concerned in crossings, conflicts, or common use of poles with other signal lines only, shall have a minimum of 2 feet clearance from those of other lines.

Except for fire-alarm lines this may be reduced where desired, unless one set of conductors is for public use and the other is used in the operation of supply lines.

(f) *Grounding, Isolation, or Protection*. Signal lines, including fire-alarm lines, if at any point in their course exposed by supply (or trolley) lines over 400 volts to ground, shall be protected at each station for public use. These lines shall elsewhere be isolated by elevation or otherwise guarded so as to be inaccessible to the public.

Signal lines used in the operation of supply lines shall be at all points isolated by elevation or otherwise guarded so as to be inaccessible to the public.

910—*Signal Lines Used Exclusively in the Operation of Supply Lines.*

(a) *Under Other Lines*. Such signal lines when (1) crossed over by, or (2) having conflicting with them, or (3) on common poles and below, high-voltage direct-current trolley circuits or other supply lines in the operation of which they are used, may be considered and run as ordinary signal lines if (1) the signal lines do not cross over or conflict with, and are not on common poles with and higher than other lines or equipment, and (2) the signal lines and connected equipment are adequately guarded and accessible only to authorized persons.

The supply lines concerned above are not required by the conditions described to comply with the requirements of Sections VI and VIII as to strength of construction, but the conductors shall be not smaller than permitted by Rule 906.

(b) *Over Other Lines*. Such signal lines, if crossing over, conflicting with or higher on common poles with other lines or equipment shall comply with all the requirements for the highest voltage supply lines not over 7,500 volts with which the signal lines may come in contact, except as to wire sizes for grade C, for which see Rule 906. If, however, the signal lines are protected by fuseless lightning arresters, drainage coils, or other suitable protective devices to prevent the signal-line voltage from normally exceeding 400 volts to ground, they may be run as ordinary signal lines. The method used shall be consistently adhered to throughout the extent of the signal system.

SECTION X

UNDERGROUND LINES

1001—*Location and Accessibility of Conduits and Manholes.*

Underground systems of electrical conductors should be so located as to be subject to the least practicable amount of disturbance. When being designed and installed, care should be exercised to avoid catch-basins, street-railway tracks, gas pipes, or other underground structures.

To facilitate installing and withdrawing cables and conductors, the ducts between adjacent manholes or other outlets should be installed in straight lines, except when it is necessary to install curves, in which case they should be of the greatest practicable radius.

Manholes shall, where practicable, be so located as to provide convenient access, and, if possible, so that the least horizontal distance from any rail of a railroad track to the nearest edge of a manhole opening is not less than 3 feet.

1002—*Grading of Ducts.*

Where necessary, manholes or handholes should be so located and ducts so graded that drainage of ducts will always be toward manholes or handholes. To insure satisfactory drainage, the ducts shall be so installed as to provide, where practicable, a grade of not less than 3 inches in 100 feet of length.

1003—*Mechanical Details of Manholes.*

The mechanical design and construction of manholes and handholes shall be such as to provide sufficient strength to safely sustain, with a suitable margin of safety, the mechanical loads which reasonably may be expected upon them.

The entrance to all manholes shall be not less than 24 inches minimum diameter. Round openings are recommended.

Manholes should be so constructed, when practicable, that the least inside horizontal dimensions will be not less than 3 feet 6 inches and should be so arranged as to maintain, if practicable, a clear working space not less than 3 feet horizontally and 5 feet vertically.

Where surface or ground water is liable to enter manholes containing supply conductors, these shall be so arranged, if practicable, as to provide permanent drainage.

Where drainage is into sewers, suitable traps shall be arranged to prevent entrance of sewer gas into manholes.

Manholes shall have adequate ventilation to open air where this is practicable and can be arranged without permitting entrance into the manhole of surface water, and such ventilation shall always be provided where any opening exists from such chambers into subways entered by the public, as with some subway conduit systems.

1004—*Manhole Covers and Guards.*

Manholes and handholes, while not being worked in, shall be securely closed by covers of sufficient strength to sustain such mechanical loads as may reasonably be expected to be imposed upon them, and the arrangement shall be such that a tool or appliance is required for their opening or removal.

Manhole openings shall be so arranged that when they are uncovered

barrier or other suitable guards may be placed to effectively protect the opening.

1005—*Material, Size, and Finish of Ducts.*

Ducts used in underground systems of distribution for electrical supply and signal conductors shall be of such material size, mechanical strength, and finish as to facilitate the installation and maintenance of conductors or cables.

1006—*Installation of Conduits.*

Ducts should be suitably reinforced or be laid on suitable foundations of sufficient mechanical strength where necessary to protect them from settling, and should be protected by concrete or other covering where necessary to prevent their disturbance by workmen when digging or by other causes. The distance between the top of the conduit covering and the pavement surface or other surfaces under which the duct run is constructed shall be sufficient to protect the conduit from injury and shall generally be at least 30 inches to the under side of the track rails of main-line railways operated by steam, electric, or other motive power, not including two-track spurs, narrow-gage tracks, or tracks used for temporary construction, between which conduit passes.

Ducts shall have clear bores and be freed from burrs before laying. They shall be laid in line in such manner as to prevent shoulders at joints.

Iron-pipe conduit terminating in manholes, handholes, or other permanent openings of underground systems shall be provided with an effective bushing or other smooth outlet.

Duct runs should provide as great a clearance from other underground structures as practicable, and particularly from gas lines paralleling them.

Conduits for underground conduit systems to be occupied by signal conductors for public use should, where practicable, be separated from underground conduit systems for supply conductors by not less than 6 inches of concrete or its equivalent.

Cable extensions may, however, be made to existing interconnected or jointly owned and jointly occupied duct systems used in common by municipalities, signal, and power companies, with less effective separations than above specified.

Where signal conductors for public use and supply conductors occupy ducts terminating in the same manhole, the two classes of ducts should be separated as widely as practicable; and, where practicable, enter the manhole at opposite sides, so that cables can be racked along side walls with a minimum of crosses between the two classes of conductors.

Joints in duct runs shall be made mechanically secure to maintain individual ducts in alignment.

Duct openings into manholes or handholes should, where practicable, have a clearance above the floor or below the roof line of not less than 6 inches.

Ducts of laterals supplying service to building, where gas or water is liable to enter through them, should be effectively plugged or cemented.

Conduits designed to carry supply cables of large current capacity

should be arranged, where practicable, so that no ducts necessarily dissipate heat solely through adjacent ducts.

1007—*Location and Identification of Conductors.*

Underground systems of electrical supply conductors and of signal conductors for public use should, in general, be maintained in separate conduits and manholes.

Cable extensions to existing interconnected or jointly owned and jointly occupied duct systems used in common by municipalities, signal companies, and power companies are exempted from the above.

When signal cables for public use and supply cables occupy the same manholes, they should be maintained at opposite sides of the manhole; and where the supply cables are of large current capacity all cables should be specially protected against injury by arcing. When it is necessary that the signal and supply cables cross in any manhole, a spacing of at least 1 foot shall be maintained, and special mechanical protection provided against abrasion or injury by arcs.

Cables shall be permanently identified by tags or otherwise at each manhole, handhole, or other permanent opening of the underground system, except where their position, in conjunction with diagrams supplied to workmen, give sufficient identification.

Cables in manholes shall be reasonably accessible from the clear working space at all times. When cables cross other cables, sufficient clearances shall be provided between them to permit reasonable access to any cable for inspection and repair and to prevent abrasion.

Joints made in, or branches made from, underground cables should be reasonably accessible at all times and should be in manholes or handholes, and as seldom as possible in the ducts themselves.

Each cable, where practicable, shall maintain a vertical clearance above the floor of any manhole of not less than 6 inches.

1008—*Mechanical Protection, Support, and Guarding of Live Parts.*

Cables, unless rubber insulated, shall be provided with a watertight metal sheath or other waterproof covering over their insulating coverings, except when used as ground connections or neutrals.

Protective, control, or other apparatus on supply lines where installed and maintained in manholes and handholes shall have live parts inclosed in suitable cases. The metal sheathing of all supply conductors or cables shall be made mechanically and electrically continuous with the metal cases of protective, control, or other apparatus.

Mechanical support shall be provided for all cables at each manhole, handhole, or other permanent opening. Where closely grouped lead-covered cables include cables operating at over 7,500 volts, they should have suitable fire-resistive coverings to prevent damage from arcing.

Such protection is also frequently advisable where voltages are less than 7,500 volts, especially where some of the cables are of large current capacity.

Conductors or cables from underground systems which connect to overhead systems shall be mechanically protected by installing them in grounded metal conduit or, in the case of signal cable or metal-sheathed cable, in other substantial conduit, and shall terminate in suitable potheads or similar devices of approved design or construction; the open supply wiring connecting to the underground system

shall begin not less than 10 feet above the ground surface or platform accessible to the public.

Joints or terminals of supply conductors or cables of underground systems shall be so arranged that there are no bare ungrounded current-carrying metal parts exposed to accidental contact within manholes or handholes.

1009—*Spacing of Cables.*

Cables shall be so arranged and supported in ducts and manholes that those of higher operating voltages are separated from those of lower voltages as far as practicable.

Cables belonging to different systems (particularly supply distribution and signal systems) shall not be run in the same duct.

1010—*Multiple Connections.*

When transformers, regulators, or other similar apparatus operate in multiple, special tags or other suitable means shall be used to indicate that fact.

SECTION XI

INDUCTIVE INTERFERENCE MEASURES

1101—*Application.*

The requirements of this section (except as otherwise provided in Section I, paragraph 109), shall apply and be effective as follows:

(a) Rules limited to lines involved in a parallel or to apparatus connected to such lines, shall apply only in case of parallels created hereafter; except that rules relating to operation or maintenance shall apply to all such lines and apparatus both existing and new.

(b) Rules not limited to lines involved in a parallel or to apparatus connected to such lines, shall apply to new construction only, including, however, existing lines and apparatus when such are generally reconstructed or renewed.

(c) The rules of paragraphs 1101 to 1106, inclusive, apply only to overhead open-wire constant-potential alternating-current supply transmission or distribution circuits or electrically connected network which have 5,000 volts or more between any two conductors, or 2,900 volts or more between any conductor and ground (except railway trolley circuits and feeders electrically connected therewith), which are involved in parallelism with overhead open-wire signal circuits or which are liable to become so involved. Other types of supply and signal circuits are specifically covered in rules of paragraph 1107.

(d) With some parallels interference occurs only at times of abnormal conditions on the supply circuit, in which case such of these rules as affect induction only under normal operating conditions do not apply. When the application of any rule is thus restricted, the condition under which the rule applies is referred to as a "normal" parallel.

1102—*Notice of Intention.*

The party proposing to build a new supply or signal line, of the character covered by the rules of this section, which will create a parallel, or generally to reconstruct or change the operating conditions of an existing line involved in a parallel, shall give due notice (not less than sixty days where practicable, but in any event not less than

twenty days in advance of construction, except for minor extensions, for which notice shall be given immediately after the work is authorized) of such intention to the other party, including full information as to the location within the parallel, and such other features of the proposed line as would affect induction.

1103—Location of Lines.

(a) *Distance Between Lines.* Supply lines and signal lines shall be kept as far apart as practicable. Their separation should be at least sufficient to avoid conflict except when closer proximity is unavoidable. (This does not apply to situations where the supply line is of such voltage and the signal line of such character that joint construction is permissible.)

If in any case of inductive interference it should be found impracticable to obtain the proper degree of relief by means of the remedial measures set forth in these rules or by other measures of a remedial nature, the parties concerned shall agree upon and put into effect a plan for increasing the separation of the lines within the parallel.

To promote the effective application of transpositions, both parties shall endeavor to maintain uniform separation of the two lines throughout each normal parallel unless a substantial increase of separation for a considerable portion of the parallel can be obtained by departing from this rule.

(b) *Length of Parallels.* Parallels shall be made as short as practicable.

(c) *Discontinuities.* In the location, construction and general reconstruction of lines within normal parallels, every reasonable effort shall be made to avoid discontinuities (except those due to increases in separation as provided for in (a) above), which would interfere with the application of effective and economical coordinated transposition systems in the supply and signal lines.

1104—Design and Construction of Lines.

(a) *Arrangement and Spacing of Supply Conductors.* In the design for construction or general reconstruction of supply lines, consideration shall be given to the configuration of the lines with a view to minimizing (1) throughout the entire length of the line inequalities among the capacitances to earth of the conductors; and (2) within normal parallels the intensity of the inductive effects. When two or more circuits are carried on one line, the phase relations among the conductors of the different circuits should be chosen with the same purposes in view. The configurations to be preferred for three-phase lines under different conditions are discussed in the exhibit following this section.

Excessive spacing of conductors should be avoided.

Two-wire branches electrically connected to a three-phase supply circuit should be avoided, except those so short that they do not materially unbalance the three-phase circuit. Where such branches are employed they should be so distributed as to cause minimum unbalance.

No single-wire grounded supply circuits or branches of multiwire supply circuits shall be employed.

(b) *Transpositions—General.* All supply circuits and metallic signal circuits, or extensions of such circuits, hereafter constructed or

generally reconstructed, shall be transposed throughout their entire lengths in such manner as to balance, as nearly as practicable, the capacitances to earth of their conductors. For single-circuit three-phase lines the maximum length of barrel for this purpose shall be 12 miles for circuits of triangular* configuration and 6 miles for other configurations. For twin-circuit three-phase lines, the maximum length of barrel shall be 6 miles; except that for circuits of the vertical type (including cases with the middle conductors displaced slightly outward) and the equilateral triangular type with vertices upward, nine-mile barrels may be used when the circuits are interconnected for minimum unbalances.

Exceptions: Supply lines, located principally on private rights of way and not electrically connected to the other lines, are exempt from this rule if separated from existing signal lines, and from highways required for the future construction of signal lines, by distances not less than those given below, except for crossings at angles over 30 degrees and other sections of unavoidable closer proximity not exceeding one mile in total length in each ten consecutive miles of line; provided, however, that such sections of closer proximity to any one such communication line or highway shall not exceed one mile in each thirty consecutive miles of line.

<i>Voltage between supply conductors</i>	<i>Minimum separation from highways and signal lines</i>
Below 50,000.....	600 feet
50,000—75,000.....	750 feet
75,000—100,000.....	850 feet
100,000—150,000.....	1,000 feet
150,000—200,000.....	1,200 feet

For supply lines meeting all these conditions for exemption, except that they are electrically connected to other lines through autotransformers, the maximum lengths of barrel may be twice those specified above.

The question of whether highways that may be involved will be required for future signal lines shall be settled by agreement between the supply-line company contemplating the construction, the signal companies operating within the territory to be traversed, and this Commission. In the event of disagreement, or if there is no such signal company, the matter shall be referred to this Commission. In cases where the proposed use of a particular highway by a signal company would be the determining factor in deciding whether a given supply line must be transposed, such signal company shall make an effort to locate its proposed line elsewhere and the decision shall be made in accordance with principle of least cost laid down in Section I, paragraph 107.

Existing supply circuits and those exempted under the preceding paragraph, which hereafter become involved in normal parallels, shall be transposed so as to balance their capacitances to earth, when necessary for limiting residual voltages and currents to amounts which can be tolerated. The location and number of transpositions for this purpose shall be determined by agreement of the parties concerned. (See Rule 108 for Division of Costs.)

In the location and spacing of transpositions, due regard shall be paid to discontinuities which affect the capacitances of the circuit. Sections of circuit between such points of discontinuity should be treated independently.

In general, transpositions should be omitted at the junction points of successive barrels.

Metallic signal circuits, and single-phase and two-phase supply circuits, shall be transposed at intervals not exceeding 4 miles.

Supply circuits less than 3 miles in length are not required to be transposed outside of parallels, except when the absence of transpositions would materially impair the balance of other circuits to which they are electrically connected.

Supply circuits with grounded neutrals having a voltage of less than 12,500 volts between conductors are not required to be transposed out-

*A triangular configuration as here used means one in which the altitude of the triangle exceeds one-half the length of the longest side as base.

side of parallels, except where the lack of such transpositions in any specific case is the cause of interference.

Within normal parallels the transpositions in the two classes of circuits shall be as provided in (c) below. When the transpositions required in a parallel impair the general transposition system of either line outside the limits of the parallel, the necessary readjustment of transpositions shall be made in the sections of line adjacent to the parallel, as a part of the remedial measures therefor.

c Transpositions—Inside Limits of Parallels. Within each normal parallel an adequate scheme of transpositions, to neutralize so far as practicable the inductive effects, shall be installed in the supply circuits, and also in the signal circuits, provided the latter are metallic. The transposition systems in the two classes of circuits shall be properly coordinated. The parties concerned shall cooperate to determine upon the transposition scheme to be employed. The transpositions required in the line last constructed shall be installed before it is placed in service.

In applying the foregoing, the following rules shall, in general, be observed:

(1) For each normal parallel at least one barrel shall be installed in the supply circuit. This applies also to a section of parallel where it is not practicable to obtain a balance by combining it with another section. In applying this rule it is not intended ordinarily to change the span lengths required for other purposes.

(2) In long uniform parallels or sections of parallel, involving a telephone line at highway separation from the power line, the barrels shall be three miles in length, subject to such variation as may be necessary for coordination with the transpositions required in the telephone circuits. Transpositions should, in general, be omitted at the junction points of successive barrels.

(3) Except as modified by (1) above, the number of transpositions required in supply circuits paralleling telephone circuits shall be subject to the following limitations expressed in terms of the average distance between successive transpositions.

(a) For supply circuits of 50,000 volts or more between conductors, not less than one mile.

(b) For supply circuits of less than 50,000 volts between conductors, not less than one-sixth mile.*

(4) In case of a parallel between a supply line and a telegraph line or other grounded signal line, the transpositions in the supply circuit shall be located with due regard to the limits of the parallels and to discontinuities in order to form as nearly as practicable a balanced system, subject to the condition that the transpositions in the supply circuit are not required to be less than one mile apart, except as modified by (1) above. In long uniform sections of parallel, barrels six miles in length should be sufficient. Transpositions should be omitted at the junction points of successive barrels.

(5) The question of the most economical scheme to accomplish the purpose shall always be considered. Effort shall be made to utilize as many as practicable of the existing transpositions.

It is suggested that in case of a short section of a new line, not sufficient of itself to require transpositions, but which is likely to be extended later so that transpositions would then be necessary, consideration be given to the advisability of installing one or more suitably located transpositions in the new section of line while it is being constructed in order to avoid interrupting the service by adding transpositions afterwards.

Exceptions: Cases of parallelism may occur where the interference is due almost wholly to residual voltage and currents, in which event transpositions in the power circuit are not required, except as provided in paragraph 1104b.

*While barrels of approximately three miles, as provided in (2) above, are generally to be employed, the shorter barrels specified in (3) are sometimes necessary in short parallels and in short sections of parallels, in order to coordinate with the discontinuities and obtain a proper degree of balance.

1105—*Design, Construction, and Arrangement of Apparatus.*

(a) *Quality and Suitability.* In designing, specifying or otherwise determining the quality or suitability of apparatus to be connected to supply or signal circuits, and in arranging such apparatus for use, effort shall be made to avoid, so far as is reasonably practicable, all features which would tend to create or promote inductive interference under either normal or abnormal conditions. As instances in applying the foregoing, the following rules shall be observed:

(b) *Rotating Machinery.* In order to improve conditions generally, companies operating supply circuits shall make every effort to minimize the high-frequency components of voltages and currents caused by rotating machinery. All new rotating machinery shall have as nearly as practicable a pure sine wave of voltage and shall not, in any case, deviate therefrom to exceed the limit set forth in the present standardization rules of the American Institute of Electrical Engineers.

No ground connection shall be used on the armature winding of an alternating-current generator or motor electrically connected to a supply circuit involved in a normal parallel unless means are employed to avoid unbalancing the circuit and to reduce triple-harmonic residuals as far as may be necessary and practicable.

(c) *Transformers and Their Connections.* In order that the wave-shape of voltage and current may be distorted as little as practicable by transformers, all new transformers on supply circuits should have an exciting current as low as is consistent with good practice, and which shall not, at rated voltage, exceed 10 per cent of the full-load current; except that for transformers without neutral ground connections on the line side, the exciting current at rated voltage need not be less than 0.2 ampere.

Where three-phase transformers are employed with grounded neutrals, the core type is preferable to the shell type.

Transformers or transformer banks shall not be grounded at such points of their windings as to unbalance a connected circuit involved in a normal parallel. As important cases under this rule, no grounded single-phase, grounded three-wire two-phase, or grounded open-star three-phase connection shall be so employed.

No star-connected transformer or autotransformers shall be employed with a grounded neutral on the side connected to a three-phase power circuit involved in a normal parallel, unless low-impedance delta-connected secondary or tertiary windings or other equivalent means are used for suppressing the triple-harmonic components of the residual voltages and currents introduced by the transformers.

Care should be taken that the individual units in each grounded-neutral bank of transformers, connected to a circuit involved in a normal parallel, are alike as to type and rating, including all electrical characteristics, and that they are similarly connected, so as not to unbalance the circuit.

Closed-delta connections shall be used wherever practicable in preference to open-delta connections on three-phase supply circuits involved in normal parallels. When open-delta connections are employed, an effort shall be made to distribute such connections equally among the three phases.

Where triple-harmonic residual voltages and currents due to star-

connected transformer banks exist in amounts which cannot be tolerated, and it is inexpedient to isolate the transformer neutrals, such residuals shall be limited by operating the transformers at reduced magnetic density or by other available means.

(d) *Rectifiers.* Rectifiers and other apparatus tending to distort the alternating-current wave when installed on supply lines involved in normal parallels, shall, if necessary, be equipped with suitable auxiliary apparatus to prevent harmful distortion of the wave-form of power-circuit voltage or current.

(e) *Switches.* Each oil-break switch in a supply circuit involved in a parallel, located between the source or sources of energy and the parallel, and used for energizing or deenergizing the circuit, shall have all poles mechanically interconnected for simultaneous action. There shall be at least one such switch so located as to control the supply of energy to each supply circuit involved in a parallel, and, except at stations where an operator is constantly on duty, such switch shall be made automatic for short circuits, grounds, and in case of grounded neutral circuits, for abnormal neutral currents.

Careful consideration shall be given to means of minimizing transient disturbances caused by switching operations on supply circuits, which would cause inductive interference. Whenever practicable, provision shall be made for switching on the station-side than on the line-side of transformer banks.

Oil-break switches, having their poles mechanically interconnected for simultaneous action, shall be provided wherever the use of air switches or noninterconnected single-pole oil switches would cause harmful transient disturbances in parallel communication circuits.

(f) *Fuses.* Switches shall be used instead of main-line fuses wherever practicable in a supply circuit involved in a parallel.

(g) *Electrolytic Lightning Arresters.* When electrolytic lightning arresters are employed on a supply circuit involved in a parallel they shall be equipped with auxiliary charging resistances and contacts so arranged that the horn gaps are short-circuited at the time of charging, to avoid, as far as possible, the production of arcs.

(h) *Special Instruments.* Reliable indicating devices shall be installed at the source of supply of power circuits involved in parallels, to inform the operators immediately of abnormal conditions, such as grounds, and, wherever possible, open circuits, which have not operated automatic switches.

Whenever a neutral ground connection is employed on a circuit involved in a parallel, an ammeter, suitable for measuring the current in the neutral under normal operating conditions, shall be installed in each neutral connection to ground at the main generating and main attended substations on the supply system electrically connected to the circuit involved in the parallel.

(i) *Signal Apparatus.* All apparatus electrically connected to metallic signal circuits involved in parallels shall be designed and constructed so as to secure as nearly as practicable an accurate balance of the series impedances and the admittances to earth of the two sides of the circuits in order to minimize the detrimental effects of induction from parallel supply circuits.

1106—Operation and Maintenance.

(a) *General Requirements.* Supply and signal companies shall use all reasonable means to operate and maintain circuits involved in parallels in such manner as to minimize interference under conditions of normal operation, and to avoid transient disturbances.

(b) *Balance.* In the maintenance of both supply and signal circuits involved in parallels, special care shall be given to the prevention of mechanical and electrical failures which would cause or promote transient disturbances or unbalances such as those due to tree-grounds, defective or dirty insulators, or other faults.

The voltages and currents of power circuits involved in parallels shall be kept balanced as closely as practicable, and accidental unbalances shall be promptly corrected.

(c) *Record of Neutral Current.* At all points on grounded neutral systems equipped as required in paragraph 1105h, the power company shall observe and record the approximate daily maximum neutral current.

(d) *Transformers.* No transformers connected to supply circuits involved in normal parallels shall be operated at more than 10 per cent above their rated voltage. Wherever practicable in case of existing equipment and in all cases of new equipment, transformer banks with grounded neutrals on the side which is connected to a power circuit involved in a normal parallel shall not be operated at more than 5 per cent above their rated voltage.

(e) *Switching.* In all switching operations care shall be taken to avoid so far as possible the production of harmful transient disturbances.

(f) *Charging Electrolytic Lightning Arresters.* When, notwithstanding compliance with paragraph 1105g, interference is caused by charging electrolytic lightning arresters, such charging shall be done at night, so far as is possible, preferably between 2 a. m. and 4 a. m.

(g) *Abnormal Conditions.* Supply-line companies shall adopt operating rules which shall specifically outline the procedure for their operators during times when a supply circuit involved in a parallel is abnormally unbalanced, as will occur with an open, grounded, or short-circuited line or transformer winding.

Such rules shall, in general, provide for the discontinuance of operation of the supply line until the fault is remedied, excepting only those cases where it is clear that the service rendered the public by continuing operation of this section of power line is of greater importance than the signal service interrupted by such continued operation.

When it is necessary to energize a defective supply line in order to locate a fault, care shall be taken to avoid, as far as possible, repeatedly energizing any section of such line which parallels signal circuits, until the fault has been cleared. Whenever possible, the faulty section of line shall not be energized more than once until disconnected from the section of line involved in the parallel.

To facilitate the study and prevention of disturbances in signal circuits, occasioned by transient conditions of supply circuits, accurate record shall be kept of the nature and time of occurrence of failures, changes in operating arrangements, and all switching during times of

abnormal conditions of supply circuits involved in parallels; and of all transient disturbances in signal circuits. These records shall be made available for use in tracing the causes of such transient disturbances.

1107—*Other Cases of Inductive Interference.*

The rules of paragraphs 1101 to 1106, inclusive, are restricted in their application to overhead open-wire constant-potential alternating-current supply circuits of over 5,000 volts between any two conductors, or 2,900 volts from any conductor to ground and overhead open-wire signal circuits. While these include the circuits most commonly involved in inductive interference, cases sometimes occur where either the supply circuit causing the induction or the signal circuit affected by induction is of a type or character excluded in the above rules. In the following, the governing principles involved in such cases are set forth and shall be applied in the cases enumerated.

(a) *Alternating-Current Railways.* Alternating-current railway-trolley circuits as now generally operated differ radically from other types of alternating-current supply circuits in that one side of the former is grounded throughout so that they are inherently unbalanced and, moreover, cannot be transposed. To such circuits the provision of the foregoing rules in general do not apply, and are not so intended.

Where railway circuits of this character are operated, it is necessary to employ special measures in order to prevent inductive interference with neighboring signal circuits. Other than separating the two classes of lines where this is practicable, the most important of such measures can be embodied in the railway construction, and should be included in the design of the electrification after a comprehensive study of the requirements of the particular case by the parties concerned. Also, the signal circuits, if metallic, should be properly transposed and otherwise balanced as closely as practicable. The parties should endeavor to agree as to the responsibilities involved and as to further measures to be adopted, if any such are necessary. In the event of failure so to agree, the matter should be referred to this Commission.

(b) *Constant-Current Lighting Circuits.* Care should be taken in the location, design, construction, maintenance, and operation of constant-current lighting circuits (both direct-current and alternating-current) to avoid, so far as practicable, inductive interference with signal circuits. In particular, every reasonable effort should be made to avoid creating new conditions which would produce such interference, especially where telephone lines are affected. In cases where such conditions are unavoidable, remedial measures should be employed as may be necessary, the details of which should be agreed upon by the parties concerned in general accordance with the following provisions:

(1) Where necessary, the two sides of the lighting circuit should be run on one pole line within the section where the interference is set up and coordinated systems of transpositions applied to the lighting and telephone circuits.

(2) Preference should be given to those types of lamps and other equipment which do not introduce high-frequency components in the lighting current. The use of incandescent lamps instead of arc lamps is usually advantageous in this respect.

(3) Due regard should be given to the insulation and balance of both the lighting and signal circuits. Balance of the lighting circuit requires equalization of the voltages to ground of the two sides of the circuit within the section where the two circuits are in proximity. This necessitates that the circuit be well insulated and in general that the lamps be similarly dis-

tributed in the two sides of the circuit with equal numbers of lamps in the two sides between the source of supply and the section of proximity.

NOTE—It is common practice in city lighting to run single-wire circuits through many lamps in series, scattered widely, instead of carrying the return conductor on the same line, or where the two conductors are on the same line, without balancing their voltages to ground. Both of these features tend to create residuals and to cause severe inductive effects in neighboring signal circuits.

It should be practicable, by care in laying out such lighting circuits, and in locating important telephone lines, such as toll lines which occupy but a few streets, to avoid close proximity between these classes of circuits. In those cases where proximity is unavoidable, it is possible, by running both sides of the lighting circuit close together on the same line, by care in distributing the lamps, and by transposing the circuit within the section of proximity, greatly to reduce the residuals.

A considerable difference exists among the various types of lamps used, in that are lamps introduce large harmonics into the lighting circuit, while incandescent lamps produce no appreciable distortion.

The balancing of a lighting circuit can be accomplished in many different ways, depending upon the specific conditions. The simplest general procedure is outlined above.

(c) *Supply Circuits of Lower Voltages.* In case of interference with the operation of signal circuits by constant-potential alternating-current circuits of voltage lower than the limits specified in paragraph 1101c, the parties concerned should agree upon remedial measures in general accordance with Rules 1101 to 1106, inclusive, and should cooperate in applying such measures to the extent that may be necessary, as follows:

(1) Where practicable at reasonable expense, the lines should be separated sufficiently to avoid interference.

(2) Coordinated systems of transpositions should be applied to both classes of circuits within the section where the interference is set up.

(3) If practicable, the residual voltage and current of the power circuit should be reduced.

(4) Due regard should be given to the insulation and balance of metallic communication circuits.

(5) Consideration should be given to the reduction of high-frequency components of the voltages and currents of the power circuit.

NOTE—The physical principles upon which the rules as a whole are based apply in case of supply circuits of all voltages, the differences being only quantitative in respect to the relative importance of different factors.

(d) *Cables.* In case of inductive interference where either the supply circuit or the signal circuit is carried in cable, consideration should be given to the employment of such remedial measures, included in Rules 1101 to 1106, inclusive, or otherwise as may be reasonably applicable.

In such cases, particular features to which attention should be directed are: (1) Limiting the residual current of the supply circuit, (2) Balancing the signal circuits if they are metallic, and (3) Transposing the signal circuits, if they are metallic and in open wire.

NOTE—Where cables are used for either supply or signal circuits within sections where these two classes of circuits are in proximity, there is, in general, far less liability of interference, and many provisions of the recommended rules are inapplicable. In some cases, however, residual currents in cabled supply circuits may cause interference to either open-wire or cabled signal circuits, and open-wire supply circuits sometimes cause severe disturbance to signal circuits which are in cable.

(e) *Direct-Current Circuits.* In cases of inductive interference with signal circuits due to constant-potential direct-current circuits, usually occurring only where grounded railway-trolley circuits and telephone

circuits are in proximity, adequate remedial measures should be agreed upon and put into effect by the parties concerned. Where telephone circuits are involved, in addition to transposing and balancing such circuits, special consideration should be given: (1) to securing generators and motors having a voltage as free as practicable from high-frequency waves; and (2) to the use of special devices external to the generators, motors, and rectifiers which tend to absorb the high-frequency currents, and thereby prevent their appearance in the line.

NOTE—High-frequency components may occur in constant-potential direct-current circuits and occasionally constitute a source of interference. This is particularly true of electrified railway circuits which use a large amount of power. It is, therefore, provided that effort be made to secure apparatus as free as possible from such high-frequency components and that, if necessary, suitable shunt paths be provided to confine these high-frequency components to local circuits.

(g) *Other Cases of Interference.* If any case of inductive interference, not otherwise covered by these rules, should be experienced or become imminent, the parties concerned should endeavor to agree upon a procedure for avoiding preferably, or if avoidance be not feasible, for mitigating the interference by applying, to such extent as may be necessary, the measures set forth in these rules, or by other means.

(h) *Grounded Telephone Circuits.* Where grounded telephone circuits are involved in parallelism with supply circuits, and interference cannot be remedied by employing the measures set forth in these rules, the telephone circuit shall be metallicized within the paralleled section and transposed to coordinate with the transpositions in the power circuit. In this case the cost of metallicizing the telephone circuit shall be borne by the parties involved in accordance with Rule 108, Division of Costs.

EXHIBIT

ARRANGEMENT AND SPACING OF POWER CONDUCTORS

Supplementing 1104a and 1104b

The arrangement and spacing of the conductors of supply circuits are of importance in determining (1) the unbalances or inequalities among the capacitances of the conductors to ground, which cause residual voltages and currents, and (2) the intensity of the inductive effects produced in signal circuits by the balanced voltages and currents of parallel supply circuits. For sections of line within limits of parallels, consideration of the inductive effects should, in general, control rather than consideration of the capacitance unbalances. For sections of the line outside the limits of parallels, consideration of capacitance unbalances should be given the greater weight, particularly for circuits operated without grounded neutrals.

The figures and comparisons given herein apply to nontransposed circuits, but the comparisons of different configurations hold also for transposed circuits, provided the circuits are transposed identically. If there were no irregularities or inexactnesses to impair the effectiveness of a transposition system, it would be possible theoretically, neglecting the effect of phase change and attenuation, to obtain a perfect balance by means of transpositions, irrespective of the arrangement of

the conductors. Practically, however, circuits even when carefully transposed have a material resultant unbalance, particularly at the frequencies of the higher harmonics, and this unbalance is proportional to the unbalance characteristic of the circuit configuration. In a similar manner, the resultant induction due to a supply circuit is proportional to the intensity of the induction characteristic of the configuration. Configurations differ widely in respect to their characteristic unbalances and intensities of induction, some arrangements, particularly of twin circuits, giving fully 90 per cent less unbalance or induction than others.

The effects of the arrangement and spacing of conductors on the unbalances of their capacitances to ground and on the induction produced in parallel signal circuits are discussed separately.

EFFECT ON CAPACITANCE UNBALANCE

In general, the capacitances to ground of the conductors of a non-transposed multiconductor circuit are unequal, the magnitude of the percentage unbalances being determined by, and therefore characteristic of, the configuration of the circuit. This "characteristic unbalance" is an important factor in determining the residual voltage of a circuit isolated from ground, and in determining the residual current of a grounded neutral circuit, in so far as such current is caused by the line itself. Taking, as a measure of the characteristic unbalance, the residual voltage of a short, uniform, nontransposed circuit without metallic connection to ground and energized with balanced three-phase voltages between conductors, termed the "characteristic residual voltage," the following table affords a comparison of various configurations of single-circuit power lines over the practical range of cross-sectional dimensions:

Characteristic Residual Voltage; Per Cent of Balanced Three-Phase Voltage Between Conductors

<i>Configuration</i>	<i>Residual Voltage per cent</i>
Equilateral triangle	0.5 to 4
Vertical	6 to 11
Horizontal—	
Symmetrical	5 to 9
Unsymmetrical	7 to 11
Isosceles triangle—	
Base horizontal	0 to 8
Base vertical	0.5 to 9
"L"	2 to 6
Inverted "L"	4 to 7

Triangular circuits have the smallest unbalances and characteristic residual voltages. Symmetrical horizontal and vertical circuits are about alike, the vertical having slightly the greater, and unsymmetrical horizontal circuits have the largest. The characteristic residual voltages of symmetrical horizontal and vertical configurations are from two to eight times that of a corresponding equilateral triangular circuit, depending upon the spacing and height of the conductors. The characteristic residual voltages of unsymmetrical horizontal circuits are about 20 per cent greater than those of symmetrical horizontal circuits. They may, however, be reduced to those of the symmetrical cases if the position of the intermediate conductor is alternated so that its average position is midway between the two outside conductors. (If the circuit is transposed, this condition should be fulfilled in each section between transpositions.)

METHOD OF INTERCONNECTION GIVING
MINIMUM RESULTANT CAPACITANCE UNBALANCES.

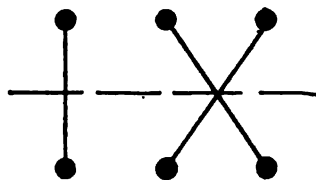


FIG. 1

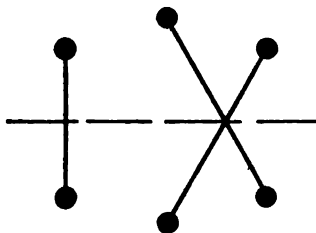


FIG. 2

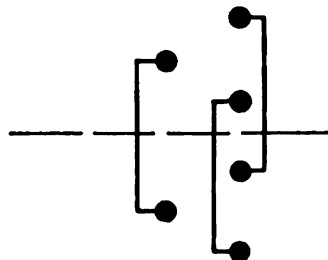


FIG. 3

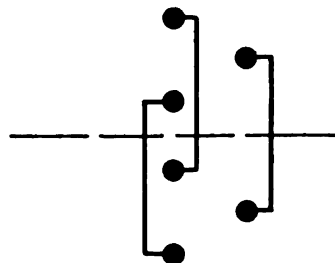


FIG. 4

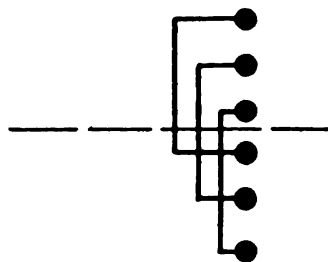


FIG. 5.

The characteristic residual voltages of equilateral triangular circuits are closely proportional to the conductor spacing, but the conductor spacing has little effect in the cases of vertical and horizontal circuits.

With twin-circuit lines, it is possible to interconnect the two circuits so that their unbalances tend to neutralize, giving smaller resultant unbalances among the capacitances of pairs of interconnected conductors than the unbalances among the conductors of individual circuits. For twin circuits of any type, the maximum unbalances occur when conductors symmetrically located with respect to an intermediate vertical plane are at common potential. This arrangement should be avoided in all cases.

For circuits of the vertical type, or with top and lowest conductors in a vertical plane and middle conductors displaced outward a small distance, the minimum resultant unbalances are obtained when the top conductors of the two circuits are at common potential and the middle and lowest conductors of one circuit are at the potentials of the lowest and middle conductors respectively of the other. (See Figs. 1 and 2.) For triangular and horizontal circuits, the minimum resultant unbalances are obtained when similarly placed conductors of each circuit are at common potential. (See Figs. 3, 4, and 5.) These figures are cross-sectional diagrams, the conductors at common potential being shown as interconnected.

The resultant unbalances with these arrangements are in some cases less than 10 per cent and, in general, less than 50 per cent of those with the worst condition described above. The arrangements which are indicated by Figs. 1, 2, and 3 give resultant unbalances of the order of magnitude of those of single-circuit equilateral triangular lines of corresponding conductor spacing, while those of Figs. 4 and 5, in general, give greater unbalances. In all cases, the characteristic residual voltage is taken as the measure of the unbalance.

Where ground wires are used or in cases where unsymmetrical circuits or more than two circuits are involved, special study is necessary to determine the best arrangement.

With twin circuits of any configuration if the interconnection giving maximum unbalance be altered by transposing the interconnecting wires the unbalance is halved. The two possible interconnections resulting from this procedure are shown in Fig. 6. This plan is useful when there is a doubt as to the best arrangement.

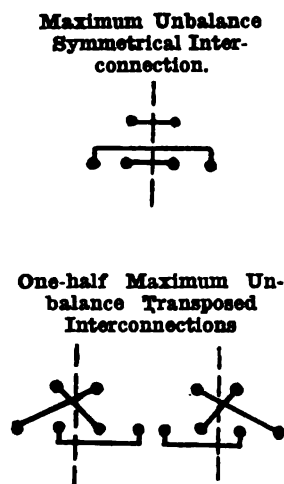


FIG. 6

To obtain the greatest advantage of arrangements giving small unbalances, the twin circuits should be interconnected at both ends of the line and at intermediate substations where practicable. In cases where twin circuits are paralleled on the station side of transformer banks but cannot be interconnected on the line side, it is still advantageous to fix the phase relation of the conductors as if they were to be interconnected for minimum unbalances.

When transposing twin-circuit lines to secure capacitance balance, the two circuits should be transposed at the same points, and care should be taken to secure the condition for minimum unbalance in each section of line between transpositions. (See Fig. 9.)

The foregoing facts have an important bearing on the number of transpositions required to adequately balance different types of circuits, more frequent transpositions being necessary in circuits of large characteristic unbalances. This has been considered in 1104b.

EFFECT ON INDUCTION FROM BALANCED VOLTAGES AND CURRENTS

The type of supply circuit producing the least inductive effects in a parallel signal circuit depends upon the spacing of the conductors and the separation from the signal circuit. In general, for all types of circuit, an increase in the spacing of the power conductors causes a proportionate increase in the magnitude of the inductive effects. Excessive spacing should therefore be avoided. On the other hand, ample spacing to prevent short circuits or grounds, due to snow, wind, birds, etc., is essential from the standpoint of inductive interference, as well as from that of power service.

For lines separated by the width of an ordinary highway, a vertical type of power circuit, in general, causes the smallest inductive effects, while the horizontal types cause the greatest effects, the triangular types being intermediate in this respect. The relative merits of different configurations vary somewhat with the separation of the two classes of lines and with the dimensions of the supply circuit, depending also upon the relative importance of the balanced voltages and currents in producing induction.

For low-voltage horizontal lines, 15,000 volts or less, a symmetrical arrangement of the conductors is better than an unsymmetrical arrangement. For lines of any voltage, if an unsymmetrical arrangement is used, the intermediate conductor should be displaced toward the signal circuit. Hence, unsymmetrical horizontal power circuits along highways should have the intermediate conductor placed on the side of the poles toward the road, where signal circuits are, or may be located on the opposite side of the road.

Methods of interconnection causing minimum inductive effects.

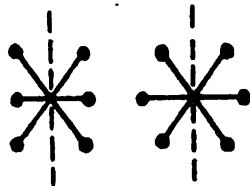


FIG. 7

FIG. 8.

When two or more synchronous circuits are carried on one line, it is possible to interconnect the conductors of the two circuits or otherwise fix their phase relations so that a partial neutralization of the inductive effects takes place. For twin circuits of the vertical type (see Figs. 7 and 8), or with the top and lowest conductors in a vertical plane and the middle conductors displaced outward a small distance, the most favorable condition is, in general, to have the diagonally opposite conductors at common potential.

For circuits of other types, the most favorable method of connection varies with the spacing and height of the supply conductors and with their position relative to the signal circuit. Thus, it is not possible to give a general recommendation, since special study is required in each specific case to determine the most advantageous method of intercon-

nection. Special study is also required for lines carrying more than two circuits of the same or different voltages, for unsymmetrical double-circuit lines, and in cases where ground wires are used.

In transposing twin-circuit lines to neutralize the inductive effects in parallel signal circuits, a similar precaution should be observed, as noted above, with respect to transpositions for capacitance balance. (See Fig. 9).

TRANSPPOSITION OF TWIN-CIRCUIT VERTICAL POWER LINES

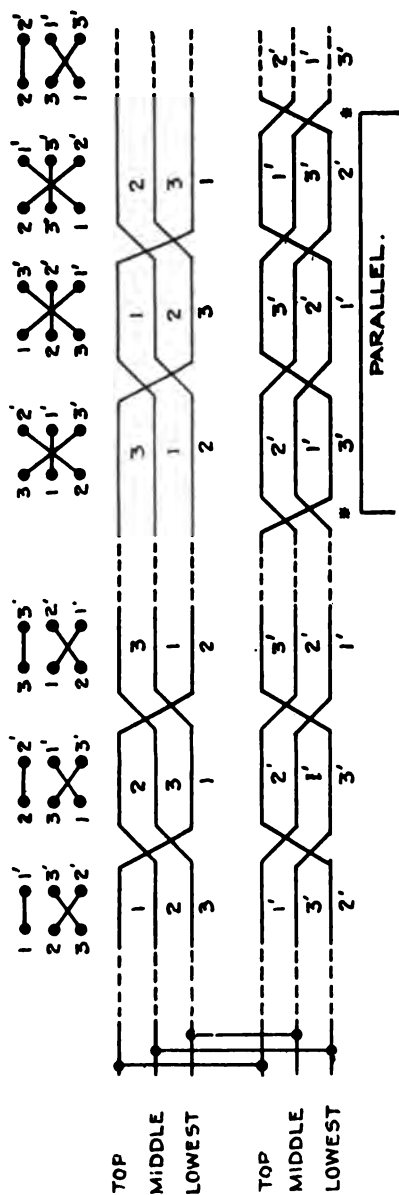


FIG. 9

* THESE TRANSPPOSITIONS (IN CIRCUIT LAST INSTALLED) OCCUR ONLY AT THE ENDS OF THE PARALLEL AND ARE FOR THE PURPOSE OF CHANGING FROM THE BEST ARRANGEMENT OUTSIDE THE LIMITS OF THE PARALLEL TO THE BEST ARRANGEMENT INSIDE THE LIMITS OF THE PARALLEL AND VICE VERSA

RECOMMENDED CONFIGURATIONS

Taking into account both effects above discussed and practical considerations of construction, the equilateral triangular configuration (either the "horizontal-base" or "wishbone" type) is, in general, recommended for single-circuit power lines; and the vertical configuration (including type of construction with middle conductors, displaced slightly outward from vertical plane of the other two) for twin-circuit power lines.

The method of transposing twin vertical lines to preserve the best relation of interconnected conductors both outside and inside limits of parallels is illustrated in Fig. 9, one barrel being shown in each location.

APPENDICES

APPENDIX A

LOADING DATA, MECHANICAL CHARACTERISTICS, AND RECOMMENDED NORMAL SAGS OF OVERHEAD LINE CONDUCTORS

While the following sags are those generally recommended, circumstances will sometimes call for modifications. For instance, where many large conductors are carried by a pole line, greater sags than those listed for the large conductors will sometimes be advisable, to reduce the stresses on poles at turns and dead-ends, and to permit smaller longitudinal guying at crossovers where such guying is called for by the rules: (See Rule 507.)

TABLE 10

Sags at 60°F. for Medium- and Hard-Drawn Covered Copper Wires, in inches

(a) Heavy-Loading Districts

Size A. W. G.	Grades of construction	Span lengths, in feet					
		100	125	150	175	200	250
No. 8	C.....	18	27	40			
No. 6	A.....	18	27	40			
	B.....	15	22	33			
	C.....	12	18	27	36		
No. 4	All.....	12	18	27	36	48	
No. 2	All.....	12	18	27	36	48	60
No. 1	All.....	12	18	26	29	33	52
No. 00	All.....	12	18	25	28	31	46
No. 0000	All.....	12	18	24	27	30	38

(b) Medium-Loading Districts

No. 8	C.....	15	22	33			
No. 6	A.....	15	22	33			
	B.....	12	18	27	36		
	C.....	10	15	22	30		
No. 4	All.....	10	15	22	30	39	
No. 2	All.....	10	15	22	27	32	50
No. 1	All.....	10	15	22	25	29	39
No. 00	All.....	10	15	22	24	26	33
No. 0000	All.....	10	15	22	23	24	29

(c) Light-Loading Districts

No. 8	C.....	12	18	27	36		
No. 6	A.....	12	18	27	36		
	B.....	10	15	22	30	38	
	C.....	8	12	18	24	32	
No. 4	All.....	8	12	18	24	32	
No. 2	All.....	8	12	18	22	26	34
No. 1	All.....	8	12	18	21	24	31
No. 00	All.....	8	12	18	20	22	28
No. 0000	All.....	8	12	18	19	21	25

TABLE 20
Sags at 60°F. for Soft-Drawn Covered Copper Wires, in inches

		(a) Heavy-Loading Districts							
Size	Grades of construction	Span lengths, in feet							
A. W. G.		100	125	150	175	200	250		
No. 6	C.....	21	32	48					
No. 4	A.....	21	32	48					
	B and C.....	18	27	40					
No. 2	A.....	18	27	40	54				
	B and C.....	15	22	33	45	60			
No. 1	A.....	15	22	33	45	60			
	B and C.....	12	18	27	37	48			
No. 00	All.....	12	18	25	33	42			
No. 0000	All.....	12	18	24	30	36			
(b) Medium-Loading Districts									
No. 6	C.....	18	27	40					
No. 4	All.....	15	22	33	48				
No. 2	All.....	12	18	27	36	48			
No. 1	All.....	12	18	25	33	42	60		
No. 00	All.....	12	18	24	30	36	48		
No. 0000	All.....	12	18	24	30	36	48		
(c) Light-Loading Districts									
No. 6	A.....	18	27	40					
	B and C.....	15	22	33					
No. 4	All.....	12	18	25	32	42			
No. 2	All.....	10	15	21	27	36	48		
No. 1	All.....	10	15	20	25	30	42		
No. 00	All.....	10	15	20	25	30	42		
No. 0000	All.....	10	15	20	25	30	42		

TABLE 21
Sags at 60°F. for Medium- and Hard-Drawn Bare Copper Wires, in inches

(a) Heavy-Loading Districts												
Size	Grades of construction	100	125	150	175	Span lengths, in feet						
A. W. G.						200	250	300	400	500	700	1000
No. 8	C.....	12	18	27								
No. 6	A.....	12	18	27								
	B.....	10	15	22								
	C.....	10	15	22	33							
No. 4	All.....	10	15	21	28	38	71	115				
No. 2	All.....	10	15	18	21	24	44	68	138	228		
No. 1	All.....	10	15	18	21	24	40	59	120	204		
No. 00	All.....	10	15	18	21	24	36	50	102	168		
No. 0000	All.....	10	15	18	21	24	32	42	84	132		
(b) Medium-Loading Districts												
No. 8	C.....	8	12	18								
No. 6	All.....	8	12	18	24							
No. 4	All.....	8	12	18	24	32	42	69	141			
No. 2	All.....	8	12	18	22	26	36	50	88	150	324	
No. 1	All.....	8	12	18	21	24	31	40	72	124	286	
No. 00	All.....	8	12	18	20	22	27	33	55	92	192	415
No. 0000	All.....	8	12	18	19	21	24	27	48	76	154	323
(c) Light-Loading Districts												
No. 8	C.....	6	9	13	20							
No. 6	All.....	6	9	13	18	24						
No. 4	All.....	6	9	13	18	22	25	40	90	137		
No. 2	All.....	6	9	13	18	18	20	30	59	98	208	
No. 1	All.....	6	9	13	18	18	20	28	52	85	178	360
No. 00	All.....	6	9	13	18	18	20	26	46	72	140	290
No. 0000	All.....	6	9	13	18	18	20	24	43	66	126	246

The following tables, 22 to 24, inclusive, give the normal and full-load tensions in pounds in copper wires corresponding to the initial 60°F. sags of Tables 19 to 21:

TABLE 22

Tensions in Hard- and Medium-Drawn Covered Copper Wires, in pounds

(a) *Heavy-Loading Districts**

A.W.G. No.	Grades of construction	Conditions	Span lengths, in feet						
			100	125	150	175	200	250	300
No. 8	C	60°F, no load	63	85	64				
		0°F, loaded	467	520	558				
No. 6	A	60°F, no load	94	98	92				
		0°F, loaded	577	635	670				
	B	60°F, no load	112	122	115				
		0°F, loaded	604	682	718				
	C	60°F, no load	140	146	140	148			
		0°F, loaded	639	713	762	820			
No. 4	All	60°F, no load	205	214	205	209	205		
		0°F, loaded	817	899	948	1007	1040		
		0°F, loaded	325	339	325	396	434	407	368
No. 2	All	60°F, no load	1081	1160	1195	1364	1472	1524	1508
		0°F, loaded	396	413	412	502	573	571	537
		0°F, loaded	1220	1314	1365	1555	1710	1708	1839
No. 1	All	60°F, no load	639	656	679	830	973	1021	1032
		0°F, loaded	1713	1796	1860	2130	2370	2545	2635
		0°F, loaded	961	1002	1092	1311	1537	1839	2065
No. 0000	All	60°F, no load	2430	2490	2620	2970	3310	3850	4220
		0°F, loaded							

*Corresponds to the initial 60°F. sags of Table 19a.

(b) *Medium-Loading Districts**

No. 8	C	60°F, no load	75	80	77				
		15°F, loaded	368	412	438				
No. 6	A	60°F, no load	112	119	115				
		15°F, loaded	457	509	534				
No. 6	B	60°F, no load	140	145	140	142			
		15°F, loaded	490	541	575	612			
No. 6	C	60°F, no load	169	175	172	172			
		15°F, loaded	517	571	614	653			
No. 4	All	60°F, no load	247	256	252	221	253		
		15°F, loaded	671	730	769	800	850		
No. 2	All	60°F, no load	392	406	399	443	439	489	453
		15°F, loaded	909	953	993	1090	1183	1250	1267
No. 1	All	60°F, no load	476	494	485	593	651	762	790
		15°F, loaded	999	1107	1126	1279	1400	1590	1629
No. 00	All	60°F, no load	758	795	772	1029	1155	1416	1413
		15°F, loaded	1501	1549	1523	1843	2042	2384	2457
No. 0000	All	60°F, no load	1159	1440	1180	1529	1920	2485	2581
		15°F, loaded	2181	2358	2122	2590	3080	3740	3870

*Corresponds to the initial 60°F. sags of Table 19b.

(c) *Light-Loading Districts**

No. 8	C	60°F, no load	94	99	94	95			
		30°F, loaded	295	323	350	373			
No. 6	A	60°F, no load	140	145	140	142			
		30°F, loaded	374	407	423	453			
	B	60°F, no load	169	175	172	172	176		
		30°F, loaded	402	439	466	492	523		
No. 4	C	60°F, no load	209	220	210	215	211		
		30°F, loaded	433	476	501	534	560		
	All	60°F, no load	306	321	306	314	309		
		30°F, loaded	574	620	639	676	695		
No. 2	All	60°F, no load	486	509	493	542	596	715	676
		30°F, loaded	797	852	852	928	1050	1171	1180
	No. 1	60°F, no load	590	613	593	691	790	955	958
		30°F, loaded	940	986	980	1103	1226	1425	1470
No. 00	All	60°F, no load	939	984	933	1153	1373	1303	1327
		30°F, loaded	1390	1433	1365	1617	1860	1923	2362
	No. 0000	60°F, no load	1434	1500	1440	1862	2205	2895	3255
		30°F, loaded	2103	2166	2022	2550	2920	3652	4034

*Corresponds to the initial 60°F. sags of Table 19c.

TABLE 23
Tensions in Soft-Drawn Covered Copper Wires, in inches

(a) Heavy-Loading Districts¹¹

Size A.W.G. Grade	Conditions	100	125	Span lengths, in feet			
No. 6	C 60°F, No load	90	83	80			
	0°F, loaded	546	594	614			
No. 4	A 60°F, no load	117	121	117			
	0°F, loaded	670	712	727			
	B and C 60°F, no load	127	143	139			
	0°F, loaded	712	778	800			
No. 2	A 60°F, no load	217	226	220	253		
	0°F, loaded	906	958	968	1088		
	B and C 60°F, no load	261	277	267	267	262	
	0°F, loaded	980	1065	1092	1124	1135	
No. 1	A 60°F, no load	317	337	325	325	319	
	0°F, loaded	1110	1195	1202	1228	1235	
	B and C 60°F, no load	396	413	396	394	396	
	0°F, loaded	1221	1314	1346	1386	1424	
No. 00	All 60°F, no load	630	656	700	696	719	
	0°F, loaded	1711	1795	1869	1920	1974	
No. 0000	All 60°F, no load	960	1000	1114	1177	1280	
	0°F, loaded	2432	2490	2640	2755	2965	

¹¹Corresponds to the initial 60°F. sags of Table 20a.

(b) Medium-Loading Districts¹²

No. 6	C	60°F, no load	94	97	95			
		15°F, loaded	428	470	488			
No. 4	All	60°F, no load	164	175	168	158		
		15°F, loaded	572	626	646	643		
No. 2	All	60°F, no load	325	338	326	333	325	
		15°F, loaded	828	881	896	923	943	
No. 1	All	60°F, no load	395	410	428	441	452	495
		15°F, loaded	953	999	1045	1090	1130	1239
No. 00	All	60°F, no load	630	653	708	769	837	984
		15°F, loaded	1322	1354	1439	1533	1639	1870
No. 0000	All	60°F, no load	960	996	1084	1173	1281	1499
		15°F, loaded	1876	1869	1975	2075	2216	2508

¹²Corresponds to the initial 60°F. sags of Table 20b.

(c) Light-Loading Districts¹³

No. 6	A	60°F, no load	94	97	95			
		30°F, loaded	313	340	348			
No. 6	B and C	60°F, no load	112	119	115			
		30°F, loaded	342	375	389			
No. 4	All	60°F, no load	205	215	222	236	234	
		30°F, loaded	476	512	544	587	603	
No. 2	All	60°F, no load	391	406	418	444	434	509
		30°F, loaded	705	742	771	823	828	953
No. 1	All	60°F, no load	477	493	532	583	633	706
		30°F, loaded	762	850	906	975	1050	1169
No. 00	All	60°F, no load	758	785	843	921	1006	1122
		30°F, loaded	1177	1181	1240	1334	1429	1555
No. 0000	All	60°F, no load	1159	1199	1291	1408	1535	1719
		30°F, loaded	1769	1769	1836	1968	2118	2300

¹³Corresponds to the initial 60°F. sags of Table 20c.

TABLE 24
Tensions in Hard- and Medium-Drawn Bare Copper Wire, in pounds
(a) Heavy-Loading Districts^{1a}

Size A. W. G. No. 8	Grade	Condition	Span lengths, in feet											
			100	125	150	175	200	250	300	400	500	700	1000	
No. 6	C	60° F., no load	63	66	68									
		0° F., loaded	423	474	510									
		60° F., no load	99	103	99									
No. 4	B	0° F., loaded	565	623	674									
		60° F., no load	119	124	122									
		0° F., loaded	588	652	709									
No. 2	C	60° F., no load	119	124	122	110								
		0° F., loaded	588	652	709	740								
		60° F., no load	187	197	202	208	200	168	149					
No. 0	All	0° F., loaded	761	832	898	965	1000	1003	994					
		60° F., no load	305	316	379	444	505	430	402	354	338			
		0° F., loaded	1018	1094	1234	1365	1489	1525	1572	1590	1609			
No. 00	All	60° F., no load	382	396	468	554	632	597	580	509	471			
		0° F., loaded	1201	1264	1421	1590	1720	1806	1884	1898	1904			
		60° F., no load	610	634	766	881	1010	1050	1092	955	909			
No. 0000	All	0° F., loaded	1696	1764	1970	2170	2366	2540	2670	2670	2670			
		60° F., no load	968	1002	1200	1403	1602	1868	2050	1835	1835			
		0° F., loaded	2472	2509	2810	3110	3390	3770	4080	3980	4100			

14Corresponds to the initial 60° F. sags of Table 21a

^{1a}Corresponds to the initial 60°F. sags of Table 21a

(b) Medium-Loading Districts^{1b}

C	No. 8	60° F., no load	93	96	94
		15° F., loaded	249	290	422
All	No. 6	60° F., no load	147	155	148
		15° F., loaded	476	529	567
All	No. 4	60° F., no load	235	247	237
		15° F., loaded	633	692	726
All	No. 2	60° F., no load	377	397	379
		15° F., loaded	849	934	958
All	No. 1	60° F., no load	472	497	466
		15° F., loaded	1084	1099	1109
All	No. 00	60° F., no load	753	789	757
		15° F., loaded	1510	1575	1543
All	No. 0000	60° F., no load	1195	1261	1203
		15° F., loaded	2260	2320	2220

¹⁰Corresponds to the initial 60° F. sag of Table 21-b.

^{1b}Corresponds to the initial 60°F. sags of Table 21-b.

TABLE 24—Continued
(c) Light-Loading Districts^a

Size A.W.G. No. 8	Grade C	Condition	100	125	150	175	Span lengths, in feet						
		60° F., no load	125	130	129	115	200	250	300	400	500	700	1000
No. 6	All	30° F., loaded	291	323	350	383							
		60° F., no load	198	206	202	203	198						
		30° F., loaded	408	447	495	509	532						
No. 4	All	60° F., no load	315	328	325	315	345	476	424	378	346		
		30° F., loaded	563	605	635	663	708	873	893	929	982		
		60° F., no load	505	526	521	518	674	943	864	823	773	715	
No. 2	All	30° F., loaded	810	856	874	898	1067	1354	1332	1389	1415	1447	
		60° F., no load	632	659	653	649	845	1182	1224	1164	1109	1046	1008
		30° F., loaded	982	1027	1040	1060	1267	1621	1704	1733	1759	1791	1850
No. 00	All	60° F., no load	1007	1050	1040	1033	1344	1890	2087	2110	2104	2110	2087
		30° F., loaded	1486	1533	1517	1512	1858	2412	2635	2710	2740	2813	2854
		60° F., no load	1600	1670	1650	1650	2140	3000	3600	3600	3650	3740	3920
No. 0000	All	30° F., loaded	2320	2360	2340	2320	2860	3760	4380	4410	4470	4590	4820

^aCorresponds to the initial 60° F. sags of Table 21-c.

The following tables, 25 to 27, inclusive, give the normal and full-load stresses in pounds per square inch in copper wires corresponding to the initial 60°F. sags of Tables 19 to 21.

TABLE 25
Stresses in Hard- and Medium-Drawn Covered Copper Wires,
in pounds per square inch

(a) Heavy-Loading Districts¹⁷

Size A.W.G. Grade	Condition	Span lengths, in feet					
		100	125	150	175	200	250 300
No. 8	C 60°F, no load	4,820	5,030	4,890			
	0°F, loaded	35,900	40,000	42,800			
No. 6	A 60°F, no load	4,540	4,740	4,620			
	0°F, loaded	23,000	26,800	32,500			
	B 60°F, no load	5,450	5,930	5,580			
	0°F, loaded	29,300	33,100	34,800			
No. 4	C 60°F, no load	6,800	7,100	6,800	6,940		
	0°F, loaded	31,000	34,600	37,000	39,800		
	All 60°F, no load	6,260	6,530	6,260	6,375	6,260	
	0°F, loaded	24,900	27,400	28,900	30,700	31,700	
No. 2	All 60°F, no load	6,250	6,520	6,250	7,260	8,340	7,820 7,070
	0°F, loaded	20,800	22,800	23,000	26,250	28,300	29,300 29,000
No. 1	All 60°F, no load	6,030	6,280	6,270	7,640	8,720	8,690 8,170
	0°F, loaded	18,600	20,000	20,800	23,700	26,050	26,000 28,000
No. 00	All 60°F, no load	5,990	6,240	6,470	7,900	9,260	9,780 9,830
	0°F, loaded	16,300	17,100	17,700	20,270	22,550	24,200 25,100
No. 0000	All 60°F, no load	5,780	6,030	6,580	7,890	9,260	11,370 12,430
	0°F, loaded	14,650	15,000	15,800	17,900	19,950	23,200 25,250

¹⁷Corresponds to the initial 60°F. sags of Table 19-a.

(b) Medium-Loading Districts¹⁸

No. 8	C 60°F, no load	5,780	6,140	5,930			
	15°F, loaded	23,300	31,700	33,700			
No. 6	A 60°F, no load	5,440	5,780	5,590			
	15°F, loaded	22,200	24,700	25,900			
	B 60°F, no load	6,800	7,060	6,800	6,880		
	15°F, loaded	23,800	26,250	27,900	29,700		
No. 4	C 60°F, no load	8,190	8,500	8,340	8,380		
	15°F, loaded	25,100	27,700	29,800	31,700		
	All 60°F, no load	7,530	7,810	7,670	6,740	7,710	
	15°F, loaded	20,450	22,250	23,450	24,400	25,900	
No. 2	All 60°F, no load	7,510	7,790	7,660	8,510	9,390	9,380 8,900
	15°F, loaded	17,450	18,500	19,150	20,900	22,700	24,000 24,800
No. 1	All 60°F, no load	7,250	7,510	7,380	8,370	9,910	11,600 12,020
	15°F, loaded	15,200	16,850	17,150	19,450	21,300	24,200 24,800
No. 00	All 60°F, no load	7,220	7,480	7,350	9,510	11,000	13,490 13,460
	15°F, loaded	14,300	14,750	14,550	17,550	19,450	22,700 23,400
No. 0000	All 60°F, no load	6,970	8,670	7,110	9,210	11,560	14,990 15,560
	15°F, loaded	13,150	14,200	12,800	15,600	18,550	22,550 23,300

¹⁸Corresponds to the initial 60°F. sags of Table 19-b.

(c) Light-Loading Districts¹⁹

No. 8	C 60°F, no load	7,220	7,500	7,220	7,310		
	30°F, loaded	22,700	25,200	26,900	28,700		
No. 6	A 60°F, no load	6,800	7,060	6,800	6,880		
	30°F, loaded	18,150	19,850	20,800	22,000		
	B 60°F, no load	8,190	8,500	8,340	8,380	8,620	
	30°F, loaded	19,500	21,300	22,600	23,900	25,400	
No. 4	C 60°F, no load	10,150	10,650	10,200	10,410	10,250	
	30°F, loaded	21,000	23,100	24,300	25,900	27,200	
	All 60°F, no load	9,340	9,780	9,380	9,580	9,480	
	30°F, loaded	17,500	18,900	19,500	20,600	21,200	
No. 2	All 60°F, no load	9,330	9,770	9,360	10,400	11,430	13,710 12,980
	30°F, loaded	15,300	16,350	16,300	17,800	19,500	22,500 22,650
No. 1	All 60°F, no load	8,990	9,410	9,020	10,520	12,020	14,540 14,600
	30°F, loaded	14,300	15,000	14,900	16,800	18,650	21,700 22,350
No. 00	All 60°F, no load	8,940	9,370	8,980	11,020	13,090	12,410 17,400
	30°F, loaded	13,250	13,650	13,000	15,400	17,700	18,350 22,500
No. 0000	All 60°F, no load	8,640	9,040	8,680	11,220	13,280	17,420 19,600
	30°F, loaded	12,700	13,050	12,300	15,350	17,600	22,000 24,300

¹⁹Corresponds to the initial 60°F. sags of Table 19-c.

TABLE 26
Stresses in Soft-Drawn Covered Copper Wires, in pounds per square inch
(a) Heavy-Loading Districts²⁰

Size A.W.G. Grade	Condition	Span lengths, in feet					
		100	125	150	175	200	250
No. 6	C 60°F, no load	3,890	4,010	3,860			
	0°F, loaded	26,500	23,800	29,800			
No. 4	A 60°F, no load	3,580	3,690	3,560			
	0°F, loaded	20,400	21,700	22,150			
	B and C 60°F, no load	4,180	4,360	4,240			
	0°F, loaded	21,700	23,700	24,400			
No. 2	A 60°F, no load	4,170	4,350	4,230	4,865		
	0°F, loaded	17,400	18,400	18,600	20,900		
	B and C 60°F, no load	5,000	5,320	5,130	5,130	5,030	
	0°F, loaded	18,800	20,460	21,000	21,600	21,800	
No. 1	A 60°F, no load	4,825	5,130	4,950	4,950	4,850	
	0°F, loaded	16,900	18,200	18,300	18,700	18,800	
	B and C 60°F, no load	6,030	6,280	6,090	6,090	6,030	
	0°F, loaded	18,600	20,000	20,500	21,100	21,700	
No. 00	All 60°F, no load	5,990	6,240	6,070	6,040	6,350	
	0°F, loaded	16,300	17,100	17,800	18,300	18,800	
No. 0000	All 60°F, no load	5,780	6,030	6,720	7,090	7,715	
	0°F, loaded	14,650	15,000	15,900	16,600	17,800	

²⁰Corresponds to the initial 60°F. sags of Table 20-a.

(b) Medium-Loading Districts²¹

No. 6	C	60°F, no load	4,540	4,730	4,610			
		15°F, loaded	20,800	22,800	23,700			
No. 4	All	60°F, no load	5,000	5,330	5,130	4,820		
		15°F, loaded	17,450	19,100	19,700	19,600		
No. 2	All	60°F, no load	6,240	6,480	6,250	6,230	6,240	
		15°F, loaded	15,900	16,900	17,200	17,800	18,100	
No. 1	All	60°F, no load	6,010	6,240	6,520	6,710	6,880	7,540
		15°F, loaded	14,500	15,200	15,900	16,600	17,200	18,550
No. 00	All	60°F, no load	5,990	6,210	6,740	7,330	7,970	9,360
		15°F, loaded	12,600	12,900	13,700	14,600	15,600	17,800
No. 0000	All	60°F, no load	5,780	6,000	6,530	7,090	7,720	9,030
		15°F, loaded	11,300	11,250	11,900	12,500	13,350	15,100

²¹Corresponds to the initial 60°F. sags of Table 20-b.

(c) Light-Loading Districts²²

No. 6	A	60°F, no load	4,540	4,730	4,610			
		30°F, loaded	15,200	16,500	16,900			
	B and C	60°F, no load	5,440	5,780	5,590			
		30°F, loaded	16,600	18,200	18,900			
No. 4	All	60°F, no load	6,260	6,500	6,760	7,200	7,150	
		30°F, loaded	14,500	15,600	16,600	17,900	18,400	
No. 2	All	60°F, no load	7,510	7,790	8,020	8,510	8,330	9,770
		30°F, loaded	13,550	14,250	14,800	15,800	15,900	18,300
No. 1	All	60°F, no load	7,250	7,510	8,100	8,370	9,640	10,760
		30°F, loaded	11,600	12,950	13,800	14,850	16,000	17,800
No. 00	All	60°F, no load	7,220	7,480	8,030	8,780	9,530	10,690
		30°F, loaded	11,200	11,250	11,800	12,700	13,600	14,800
No. 0000	All	60°F, no load	6,970	7,220	7,730	8,470	9,250	10,340
		30°F, loaded	10,650	10,650	11,050	11,850	12,750	13,850

²²Corresponds to the initial 60°F. sags of Table 20-c.

TABLE 27
Stresses in Hard- and Medium-Drawn Bare Copper Wires, in pounds per square inch
(a) Heavy-Loading Districts^a

Size A. W. G. No. 8	Grade C	Condition	100	125	150	175	Span lengths, in feet					500	700	1000
		60° F., no load	8,820	5,020	4,820									
		0° F., loaded	32,500	36,400	39,200									
No. 6	A	60° F., no load	4,800	5,010	4,800									
		0° F., loaded	27,400	30,500	32,700									
No. 6	B	60° F., no load	5,790	6,000	5,900									
		0° F., loaded	28,500	31,600	34,000									
No. 8	C	60° F., no load	5,790	6,000	5,900	5,360								
		0° F., loaded	28,500	31,600	34,400	35,900								
No. 4	All	60° F., no load	5,800	6,010	6,170	6,330								
		0° F., loaded	23,200	25,350	27,400	29,400	6,090	5,120	4,540					
No. 2	All	60° F., no load	5,850	6,070	7,280	8,520	9,700	8,250	7,720					
		0° F., loaded	19,550	21,000	23,700	26,200	28,600	29,300	30,200	6,800	6,480			
No. 1	All	60° F., no load	5,820	6,030	7,120	8,440	9,630	9,030	8,330	7,750	7,170			
		0° F., loaded	18,300	19,250	21,650	24,050	26,200	27,500	28,700	28,900	29,000			
No. 00	All	60° F., no load	5,810	6,030	7,190	8,400	9,620	10,000	10,390	9,100	8,650			
		0° F., loaded	16,150	16,800	18,750	20,700	22,500	24,200	27,600	25,400	25,400			
No. 0000	All	60° F., no load	5,820	6,030	7,240	8,460	9,660	11,240	12,840	11,060	11,060			
		0° F., loaded	14,900	15,100	16,950	18,750	20,400	22,700	24,600	24,000	24,700			

^aCorresponds to the initial 60° F. sag of Table 21-a.

(b) Medium-Loading Districts^a

Size A. W. G. No. 8	Grade C	Condition	100	125	150	175	Span lengths, in feet					500	700	1000
		60° F., no load	7,100	7,550	7,220									
		15° F., loaded	26,800	30,000	32,400									
No. 6	All	60° F., no load	7,150	7,515	7,260	7,345								
		15° F., loaded	23,100	26,700	27,500	29,400								
No. 4	All	60° F., no load	7,170	7,545	7,230	7,375	7,210	8,560	7,520					
		15° F., loaded	19,300	21,100	22,100	23,500	24,500	28,200	28,400	28,900				
No. 2	All	60° F., no load	7,245	7,625	7,290	8,100	8,950	10,100	10,400	10,610				
		15° F., loaded	16,700	17,950	18,400	19,800	21,600	24,300	26,100	28,400	9,750	8,950		
No. 1	All	60° F., no load	7,195	7,560	7,245	8,340	9,445	11,650	13,000	12,840	28,650	28,500		
		15° F., loaded	15,750	16,750	16,900	18,750	20,650	23,900	26,200	28,300	27,500	27,000		
No. 00	All	60° F., no load	7,170	7,518	7,210	8,870	10,530	12,415	15,380	16,750	13,500	14,750		
		15° F., loaded	14,380	15,090	14,700	18,100	19,050	22,600	25,600	27,800	26,200	28,150		
No. 0000	All	60° F., no load	7,200	7,595	7,245	9,400	11,100	15,150	19,240	19,350	19,350	18,510		
		15° F., loaded	13,600	13,950	13,350	16,100	18,100	22,650	27,050	27,600	27,900	28,000	28,200	

^aCorresponds to the initial 60° F. sag of Table 21-b.

TABLE 27—Continued
(c) *Light-Loading Districts*^a

Size A.W.G. No. 8	Grade C	Condition	Span lengths, in feet										
			100	125	150	175	200	250	300	400	500	700	1000
No. 6	All	60° F., no load.....	9,820	10,030	9,940	8,850							
		30° F., loaded.....	22,400	24,850	26,900	27,900							
		60° F., no load.....	9,600	10,000	9,910	9,840	9,600						
No. 4	All	30° F., loaded.....	19,800	21,750	24,050	24,600	25,800						
		60° F., no load.....	9,600	10,000	9,910	9,840	10,620	14,500	12,930	11,540	10,560		
		30° F., loaded.....	17,150	18,450	19,350	20,200	21,600	26,600	26,900	28,300	28,400		
No. 2	All	60° F., no load.....	9,700	10,100	10,010	9,960	12,950	18,120	16,580	15,820	14,850	13,750	
		30° F., loaded.....	15,500	16,450	16,800	17,250	20,500	26,000	25,600	26,700	27,200	27,800	
		60° F., no load.....	9,630	10,040	9,960	9,900	12,860	18,000	18,640	17,760	16,900	15,950	15,330
No. 00	All	30° F., loaded.....	14,950	15,650	15,850	16,150	19,800	24,700	25,950	26,400	26,800	27,800	28,200
		60° F., no load.....	9,600	10,000	9,910	9,840	12,800	17,930	19,850	20,120	20,050	20,100	19,850
		30° F., loaded.....	14,150	14,600	14,450	14,400	17,650	23,000	25,100	25,800	26,100	26,800	27,200
No. 0000	All	60° F., no load.....	9,650	10,050	9,980	9,920	12,870	18,050	21,700	21,700	21,960	22,580	23,600
		30° F., loaded.....	14,000	14,300	14,100	13,960	17,200	22,650	26,400	26,560	26,900	27,600	29,000

^aCorresponds to the initial 60° F. sag of Table 21-c.

MECHANICAL DATA FOR COPPER WIRE

The following table contains data on the ultimate strength and per cent of elongation before failure of hard, medium and soft copper wire as given in the 1915 report of the A.S.T.M.

The elastic limit as given by the same society is 55 to 60 per cent of the ultimate strength for hard-drawn copper and 50 to 55 per cent for medium-drawn copper. There is no definite elastic limit for soft copper, but its behavior, after having a slight preliminary stretch, may be considered as approximately that of an elastic material having a limit of elasticity of 10,000 to 15,000 pounds per square inch.

The modulus of elasticity has been taken at 16,000,000 for all grades of copper.

TABLE 28
Mechanical Data for Copper Wire

Size A. W. G.	Diameter, inches	Hard-drawn		Medium-drawn		Elongation, per cent	Soft-drawn	
		Average ultimate tension, pounds	Average elongation, per cent	Average minimum ultimate, pounds	Average maximum ultimate, pounds		Average ultimate tension, pounds	Average elongation, per cent
No. 8.....	0.128	63,700	1.06	49,660	56,660	1.08		
No. 6.....	0.162	62,100	1.14	49,000	56,000	1.15		
No. 4.....	0.204	60,100	1.24	48,330	55,330	1.25	37,000	30
No. 2.....	0.258	57,600	1.98	47,000	54,000	2.50		
No. 1.....	0.289	56,100	2.17	46,000	53,000	2.75		
No. 0.....	0.325	54,500	2.40	45,000	52,000	3.00		
No. 00.....	0.365	52,800	2.80	44,000	51,000	3.25	36,000	35
No. 000.....	0.41	51,000	3.25	43,000	50,000	3.60		
No. 0000.....	0.46	49,000	3.75	42,000	49,000	3.75		

RESULTANT CONDUCTOR LOADINGS

The following table gives the resultant loading in pounds per 100 feet for conductors of various sizes and materials in regions of heavy, medium, and light loading. The calculations are based on the assumed loadings given in Rule 502 and on average values of the diameters of weather-proof wires. The over-all diameters of covered wires supplied by different manufacturers vary considerably and hence average values are chosen.

TABLE 29**Bare Solid Copper**

Size A.W.G.	Diameter in inches over all	Weight of conductor in pounds per 100	Resultant loading in pounds per 100 feet		
			Heavy loading	Medium loading = 1/2 heavy	Light loading = 1/3 heavy
No. 8	0.128	5.0	77.2	51.5	34.4
No. 6	0.162	7.9	91.7	61.1	40.7
No. 4	0.204	12.6	98.1	65.5	43.5
No. 2	0.258	20.1	107.5	71.7	47.7
No. 1	0.289	25.3	113.7	75.7	50.5
No. 00	0.365	40.3	130.9	87.3	58.2
No. 0000	0.460	64.1	157.5	105.0	*80.1

T.B.W.P. Solid Copper

No. 8	0.26	7.5	100.3	67.0	44.7
No. 6	0.32	11.2	107.5	71.7	47.8
No. 4	0.38	16.4	116.4	77.7	51.3
No. 2	0.44	26.0	127.3	85.8	56.7
No. 1	0.47	31.6	134.5	89.7	59.7
No. 00	0.53	50.2	153.2	102.2	68.2
No. 0000	0.65	76.7	185.0	123.5	*96.0

T.B.W.P. Stranded Copper

No. 2	0.444	27.0	128.5	85.5	57.2
No. 1	0.518	32.3	139.5	92.3	62.0
No. 00	0.662	52.2	166.6	111.0	74.0
No. 0000	0.785	80.0	199.3	133.0	*100.0
250,000 cir. mils.	0.862	98.5	221.7	147.5	*123.0
350,000 cir. mils.	0.978	134.5	261.9	174.2	*168.0
500,000 cir. mils.	1.108	189.4	321.7	*237.0	*237.0
750,000 cir. mils.	1.343	282.2	427.2	*353.0	*353.0
1,000,000 cir. mils.	1.531	367.4	523.0	*459.0	*459.0

Bare Stranded Aluminum

No. 2	0.291	6.1	102.3	68.2	45.5
No. 1	0.328	7.7	106.5	71.0	47.4
No. 00	0.414	12.2	116.8	78.0	51.3
No. 0000	0.522	19.5	131.2	87.5	58.4

*These values are 25 per cent greater than the weight of the conductor. (See Rule 502a-2 and 502a-3.)

APPENDIX B

LOADING DATA, MECHANICAL CHARACTERISTICS, AND RECOMMENDED
TRANSVERSE STRENGTH OF OVERHEAD LINE SUPPORTS1. DATA FOR COMPUTING TRANSVERSE AND VERTICAL STRENGTH
REQUIRED FOR LINE SUPPORTS

(a) *Assumed Transverse Pressures and Vertical Loads on Conductors of Various Materials and Sizes.* The values of transverse loads computed from Rule 503 for various combinations of hazard (A, B, or C) and of loading districts (H, M, or L) are given in Table 30.

TABLE 30
Transverse Wind Pressures (Pounds per Conductor per 100 Feet)

Size A.W.G.	Diameter in inches over all	Bare Solid Copper						Light loading $L = \frac{1}{2} M = \frac{1}{2} H$		
		Heavy loading			Medium loading $M = \frac{1}{2} H$			A L	B L	C L
		A H	B H	C H	A M	B M	C M			
No. 8	0.128	118	66	38	75	44	25.0	50.0	29.3	16.7
No. 6	0.162	116	68	39	77	45	25.7	51.6	30.4	17.2
No. 4	0.204	120	70	40	80	47	26.7	53.4	31.1	17.8
No. 2	0.258	126	73	42	84	49	28.0	56.0	32.5	18.7
No. 1	0.289	129	75	43	86	50	28.7	57.4	33.3	19.1
No. 00	0.365	136	79	45	91	53	30.7	60.5	35.1	20.2
No. 0000	0.460	146	85	49	97	57	32.3	65.0	37.8	21.7
T.B.W.P. Solid Copper										
No. 8	0.26	126	73	42	84	49	28.0	56.0	32.5	18.7
No. 6	0.32	132	77	44	88	51	29.3	58.7	34.2	19.6
No. 4	0.38	138	80	46	92	54	30.7	61.4	35.8	20.5
No. 2	0.44	144	84	48	96	56	32.0	64.0	37.3	21.3
No. 1	0.47	147	86	49	98	57	32.7	65.4	38.2	21.8
No. 00	0.53	153	89	51	102	59	34.0	68.0	39.6	22.7
No. 0000	0.65	165	96	55	110	64	36.7	73.4	42.7	24.5
T.B.W.P. Stranded Copper										
No. 2	0.444	144	84	48	96	56	32.0	64.0	37.3	21.3
No. 1	0.518	152	88	51	101	59	33.7	67.4	39.3	22.5
No. 00	0.662	166	97	55	111	65	36.9	73.8	43.2	24.6
No. 0000	0.795	178	104	59	119	69	39.7	79.4	46.3	26.5
250,000 cir. mils.	0.862	186	108	62	124	72	41.4	82.8	48.2	27.6
350,000 cir. mils.	0.978	198	115	66	132	77	44.0	88.0	51.2	29.3
500,000 cir. mils.	1.108	211	123	70	140	82	46.8	93.6	54.8	31.2
750,000 cir. mils.	1.343	234	136	78	156	91	52.1	104.2	60.8	34.4
1,000,000 cir. mils.	1.531	253	147	84	169	98	56.2	112.4	65.6	37.5
Bare Stranded Aluminum										
No. 2	0.291	129	75	43	86	50.2	28.7	57.4	33.5	19.1
No. 1	0.328	133	78	44	89	51.7	29.3	59.1	34.5	19.5
No. 00	0.414	141	82	47	94	54.8	31.3	63.0	36.6	20.9
No. 0000	0.522	152	89	51	101	59.1	34.0	68.0	39.3	22.7

The over-all diameters of weatherproof wire supplied by different manufacturers vary considerably, and hence average values are chosen for the table.

The vertical loads on conductors, based on the assumptions of Rule 503a, are given in Table 31.

Values for transverse and vertical loadings for wires of other sizes and materials can be readily computed.

TABLE 31
Vertical Loads on Conductors
Bare Solid Copper

Size A.W.G.	Vertical weight in pounds per 100 feet		
	Heavy= conductor + 0.5 in. ice	Medium= conductor + 0.25 in. ice	Light= conductor only
No. 8	44.0	16.7	5.0
No. 6	49.1	20.7	7.9
No. 4	56.4	26.7	12.6
No. 2	67.3	36.0	20.1
No. 1	74.4	42.0	25.3
No. 00	94.0	59.4	40.3
No. 0000	123.8	86.1	64.1
T.B.W.P. Solid Copper			
No. 8	54.7	23.4	7.5
No. 6	62.7	29.1	11.2
No. 4	69.8	35.3	16.4
No. 2	84.3	47.4	26.0
No. 1	90.9	53.5	31.6
No. 00	113.3	74.5	50.2
No. 0000	147.6	104.7	76.7
T.B.W.P. Stranded Copper			
No. 2	85.5	48.6	27.0
No. 1	96.1	56.7	32.8
No. 00	124.5	80.6	52.2
No. 0000	159.9	112.2	80.0
250,000 cir. mils.	183.2	133.1	98.5
350,000 cir. mils.	226.4	172.8	134.5
500,000 cir. mils.	289.4	231.6	189.4
750,000 cir. mils.	397.7	331.8	232.2
1,000,000 cir. mils.	495.0	423.1	367.4
Bare Stranded Aluminum			
No. 2	53.3	22.9	6.1
No. 1	59.2	25.4	7.7
No. 00	69.1	32.8	12.2
No. 0000	83.1	48.6	19.5

(b) *Calculation of Moments of Resistance of Poles.*²⁷ The resisting moments of sound chestnut, western red cedar, cypress, and southern pine poles for varying ground-line circumferences given in Table 32 are based on a maximum allowable fiber stress of 2,500 pounds per square inch, which is one-half of the assumed ultimate strength.

The resisting moments of northern white cedar poles are based upon an allowable fiber stress of 1,800 pounds per square inch, which is one-half of the assumed ultimate strength.

The following formula has been used in calculating the moments:

$M = 0.000\ 2638\ f\ C^3$ = moment in pounds feet; where,

f = allowable fiber stress in pounds per square inch.

C = circumference of the pole at ground line in inches.

²⁷For the purposes of these rules the ground-line section is regarded as the most stressed section.

TABLE 32

Resisting Moments of Sound Chestnut, Western Red Cedar, Cypress, and Southern Pine Poles for Varying Ground-Line Circumferences, Based on a Maximum Allowable Fiber Stress of 2,500 Pounds per Square Inch.

<i>Circumference at ground, in inches</i>	<i>Resisting moments, in pound-feet</i>	<i>Circumference at ground, in inches</i>	<i>Resisting moments, in pound-feet</i>	<i>Circumference at ground, in inches</i>	<i>Resisting moments, in pound-feet</i>
24	9,120	34	25,920	44	56,160
25	10,800	35	28,280	45	60,100
26	11,590	36	30,770	46	64,200
27	12,980	37	33,410	47	68,470
28	14,470	38	36,190	48	72,940
29	16,080	39	39,120	49	77,600
30	17,810	40	42,220	50	82,440
31	19,650	41	45,450	51	87,480
32	21,610	42	48,860	52	92,780
33	23,700	43	52,430	53	98,180

For northern white cedar poles of the same ground-line circumferences, the moments are 72 per cent of the above values.

2. METHOD FOR DETERMINING SIZE OF WOOD POLE REQUIRED

Given the span length, the size, material, number, and height of conductors, the size of pole which will fulfil the requirements of Rule 505 may be obtained by use of the following formula for any transverse strength requirement as determined by hazards involved and climatic conditions imposed:

Let P_1 to P_n = Transverse pressures in pounds per 100 feet of span for all conductors concerned. (By Table 30.)

h_1 to h_n = Respective elevations in feet of conductors subjected to pressure P_1 to P_n ,

S = Span length in feet (or $\frac{1}{2}$ the sum of the adjacent spans),

(P_o = Pressure in pounds per square foot as given in Rule 503 according to local conditions (A, B, or C and H, M, or L),

Also let D = Estimated mean diameter of pole,

(H = Height of pole, above ground

Then the moment due to the pressure on the pole is $M_p = \frac{1}{2} P_o D H^2$ pound-feet, and the moment due to the pressure on the conductors is

$M_c = \frac{1}{100} (P_1 h_1 + P_2 h_2 + \dots + P_n h_n)$ pound-feet,

and the total bending moment on pole is $M = M_p + M_c$.

A pole should then be selected having a length equal to H plus the depth set in the ground, and a ground-line circumference given by Table 32, a resistive moment equal to, or greater than, M as obtained from the above formula.

The pole, of material, grade, size, and height so obtained, will meet the requirements of Rule 505.

3. ILLUSTRATION OF ALLOWABLE NUMBER OF WIRES ON A GIVEN POLE

(a) *Assumptions on which Tables 33 and 34 Are Based.* In Table 33 it is assumed (1) that all wire positions are filled and that crossarms are 2 feet apart; (2) that poles are set 5.5 feet in the ground; (3) that 6-pin crossarms are used unless otherwise stated; (4) that the placing of wires is begun at the top arm (wires 6 inches below the top of poles) and continuous to lower crossarms until limited by strength of pole or clearance of wires above ground to a minimum of 19 feet at the support. This is assumed to be the minimum allowable clearance at the support if 18 feet clearance is to be maintained at the center of the span. (See Table 3.) Frequently a less number of crossarms is necessary where larger sags make the difference in elevation between the support and the center of the span greater than 1 foot. (See sag Tables 19, 20, and 21, Appendix A.)

(b) *Use of Table 33.* The maximum number of wires which can be carried in compliance with these rules by sound chestnut, western red cedar, cypress, and southern pine poles of different ground-line circumferences and different spans for a 35-foot pole, is given in Table 33, according to the hazards involved (A, B, or C) and the loading districts considered (H, M, or L).

The table may also be used for poles of greater height by using the ground-line circumference, but reducing the allowable number of wires, in proportion to the increase in elevation of the point of application of the load.

No definite tapers are assumed in Table 33, the pole strength being based entirely upon their ground-line circumferences, assuming this to be the most stressed section.

(c) *Use of Table 34.* In order to show the wire-carrying capacities of poles of given top diameters, Table 34 is appended. In this table chestnut poles are assumed to have a uniform taper of 3 inches in circumference per 5 linear feet and western red cedar poles to have a uniform taper of 2 inches in circumference per 5 linear feet. All other assumptions are the same as for Table 33.

TABLE 33

Allowable Number of No. 4 Solid Copper T.B.W.P. Wires To Be Carried by 35-Foot Sound Chestnut, Western Red Cedar, Cypress, and Southern Pine Poles Having Ground-Line Circumferences of from 32 to 48 Inches and Under Various Hazards (A, B, or C) and Loadings (H, M, or L). (See foregoing explanatory note.)

Hazard and loading	Span in feet	Circumference of pole at ground line, in inches							
		32	34	36	38	40	42	44	48
A H.....	100	(*)	5	7	8	10	11	13	16
	125	.....	4	5	6	8	9	11	12
	150	.....	4	5	6	6	8	9	10
	200	.....	3	3	4	5	6	6	7
B H.....	100	9	11	13	15	18	22	26	30
	125	7	8	10	12	14	17	20	23
	150	6	7	8	10	12	14	16	19
	200	4	5	6	7	9	10	12	14
C H.....	100	16	20	25	30	36	†42	†48	‡56
	125	13	16	19	23	28	34	†38	†45
	150	11	13	16	19	23	27	32	36
	200	8	10	11	14	16	19	23	27
A M.....	100	(*)	9	11	13	16	18	22	26
	125	.....	7	9	10	12	15	17	20
	150	.....	6	7	9	10	12	13	16
	200	.....	4	5	6	8	9	10	12
B M.....	100	14	17	21	25	30	36	†40	†48
	125	11	13	16	19	23	28	33	†37
	150	9	11	13	16	19	22	26	31
	200	7	8	10	12	14	16	19	22
C M.....	100	26	33	†39	†48	‡55	‡63	‡72	‡72
	125	21	26	32	36	†44	‡50	‡60	‡68
	150	17	21	25	31	36	†42	†48	‡57
	200	12	15	17	21	26	32	36	†42
A L.....	100	12	14	17	21	26	31	36	†40
	125	9	11	13	17	20	23	28	33
	150	8	9	11	14	17	19	22	26
	200	6	7	8	10	12	14	16	19
B L.....	100	22	27	34	†39	†48	‡54	‡62	‡72
	125	17	21	26	32	36	†43	‡49	‡58
	150	14	17	21	25	31	36	†41	†48
	200	10	13	15	18	22	26	31	36
C L.....	100	†42	‡50	‡60	‡72	‡72	‡72	‡72	‡72
	125	34	†40	†48	‡57	‡67	‡72	‡72	‡72
	150	27	32	†39	†48	‡56	‡64	‡72	‡72
	200	19	24	29	36	†41	†48	‡55	‡62

*Blank spaces indicate that 35-foot poles cannot be used with so small a ground-line circumference, since pole top would be less than 7 inches. (See Rule 505.)

†These numbers of wires will require 8-pin crossarms.

‡These numbers of wires will require 10-pin crossarms.

‡These numbers of wires will require 12-pin crossarms.

‡These numbers of wires will fill all available pole space when carried on 12-pin crossarms. All others are carried by 6-pin crossarms.

TABLE 34

Allowable Number of No. 4 Solid Copper T.B.W.P. Wires To Be Carried by 35-Foot Chestnut and Western Red Cedar Poles Having Top Diameters of 6, 7, 8, and 9 Inches and Tapers as Indicated in the Table. All other conditions are the same as for Table 33. (See foregoing explanatory note.) For poles of greater height the allowable number of wires will be determined from 3-b above and Table 33.

Hazard and loading	Span in feet	Chestnut-taper = 3 inches in circumference per 5 linear feet				Western red cedar-taper = 1 inches in circumference per 5 linear feet			
		6-inch top	7-inch top	8-inch top	9-inch top	6-inch top	7-inch top	8-inch top	9-inch top
A H.....	100	(*)	10	12	16	(*)	5	7	10
	125	-----	8	10	12	-----	4	6	8
	150	-----	6	8	10	-----	4	5	6
	200	-----	5	6	8	-----	3	4	5
B H.....	100	14	18	23	31	7	10	14	18
	125	11	14	18	23	6	8	11	14
	150	9	12	15	19	5	7	9	12
	200	7	9	11	14	4	5	7	9
C H.....	100	25	36	†45	‡56	14	20	28	36
	125	21	27	36	†44	12	15	21	28
	150	17	23	29	36	9	13	17	23
	200	12	16	21	27	7	9	12	16
A M.....	100	(*)	15	20	26	(*)	9	12	16
	125	-----	12	16	20	-----	7	9	12
	150	-----	10	13	16	-----	6	8	10
	200	-----	7	9	12	-----	4	6	8
B M.....	100	22	29	†37	†48	12	16	22	30
	125	18	23	30	36	10	13	18	24
	150	14	18	24	31	8	11	14	19
	200	10	13	17	22	6	8	11	14
C M.....	100	†42	‡54	‡68	‡72	23	34	†43	‡56
	125	34	†43	‡54	‡67	18	25	35	†45
	150	27	36	†46	‡56	14	20	28	36
	200	19	26	34	†41	11	15	20	27
A L.....	100	19	25	33	†40	10	14	20	26
	125	15	19	25	33	8	11	15	20
	150	12	16	20	27	7	9	12	16
	200	9	12	15	19	5	7	9	12
B L.....	100	36	†47	‡59	‡72	19	27	36	†48
	125	28	36	†48	‡58	15	21	28	†37
	150	22	30	†37	†48	12	17	23	31
	200	16	21	28	36	9	12	17	22
C L.....	100	‡64	‡72	‡72	‡72	36	†48	‡65	‡72
	125	‡50	‡65	‡72	‡72	29	†39	‡51	‡67
	150	†42	‡56	‡69	‡72	23	32	†43	‡59
	200	29	†40	‡50	‡62	14	21	29	†41

*Blank spaces indicate that 6-inch poles cannot be used. (See Rule 505.)

†These numbers of wires will require 8-pin crossarms.

‡These numbers of wires will require 10-pin crossarms.

§These numbers of wires will require 12-pin crossarms.

||These numbers of wires will fill all available pole space when carried on 12-pin crossarms. All others are carried by 6-pin crossarms.

A taper of 3 inches in circumference per 5 linear feet, for chestnut, is approximately 1 inch in diameter per 5 linear feet, while a taper of 2 inches in circumference per 5 linear feet, for cedar, is approximately 1 inch in diameter per 8 linear feet. These tapers are very close to those assumed for the larger poles in generally accepted specifications.

The method of calculating Tables 33 and 34 is a process somewhat similar but reversed from that given in 2 above.

The maximum number of wires of other sizes or materials on poles of other fiber strengths may be readily computed from Tables 30 and 32.

APPENDIX C

TYPICAL EXAMPLES OF CONSTRUCTION METHODS, CLEARANCES, ETC.

<i>Rule</i>	<i>Subject</i>	<i>Figure</i>
101—	Conflicting lines	1
202a—	Clearance of poles from hydrants and pedestals.....	2
202b—	Flying taps not permitted.....	2
202d—	Clearance of poles from railway tracks.....	2
203a—	Pole brace	3
203b—	Pole guys	4
203d—	Shims, guy hooks, and thimbles.....	5
204a—	Strain insulators in pole guys.....	6
204b—	Two insulators in exposed guy strand.....	8
204c—	Grounding of guy.....	7
204g—	Insulating trolley span wire.....	9
204g—	Insulating series lamp span wire.....	10
204h—	Insulators in lowering chain of constant-current lamps.....	12
205a—	Transformers not allowed in climbing space.....	11-12
205b—	Guarding live parts and connections of transformers, cut-outs, etc.....	24-25
206a—	Branch connections in supply loops.....	2
206b—	Clearance of branch conductors.....	18
207a, b, c—	Location and suspension and maintenance of constant-current lamps.....	12
301a—	Clearance above railways, roadways, and footways.....	13
301b—	Conductors and wires crossing others.....	14-15
302a—	Clearance and separation of conductors.....	18
302b—	Location of wires of different voltage on same arm.....	16
304—	Minimum lateral working space and vertical separation between conductors at different levels on the same support.....	17
304d—	Only one buckarm.....	18
304e—	Vertical arrangement of conductors.....	17
304f—	Exceptions	19
305a—	Conductors if different sags on same supports.....	20
306a—	Climbing space, supply lines in general.....	17, 21
306c—	Signal lines below supply lines.....	22
306d—	Signal lines above supply lines.....	23
306h—	Protected longitudinal runs.....	19
306i—	Special clearance for longitudinal runs.....	19
307b—	Vertical supply and signal conductors through supply circuits.....	24-25
307d—	Clearance between conductors and from conductors to surfaces of structures	26
307e—	Specially protected conductors.....	27-29
307f—	Ground wires and grounded metal-sheath cables.....	30-31
307g—	Mechanical protection for ground wires and cables.....	32
308a—	Clearances of conductors of one line from poles of another line.....	33
309b, c—	Clearance from buildings.....	34
309e—	Protection from lines entering buildings.....	35
509a—	Alternate construction in special cases.....	36
510c—	Method of providing strength.....	36
707a—	Protection against conductor breakage, splices, and taps.....	37
905a—	Short spans	38

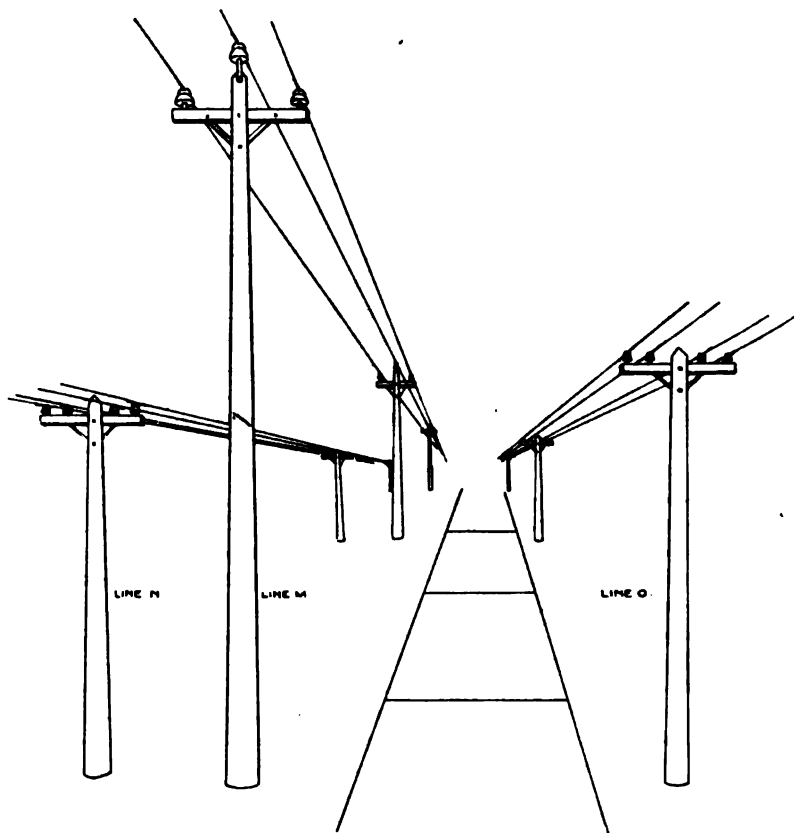
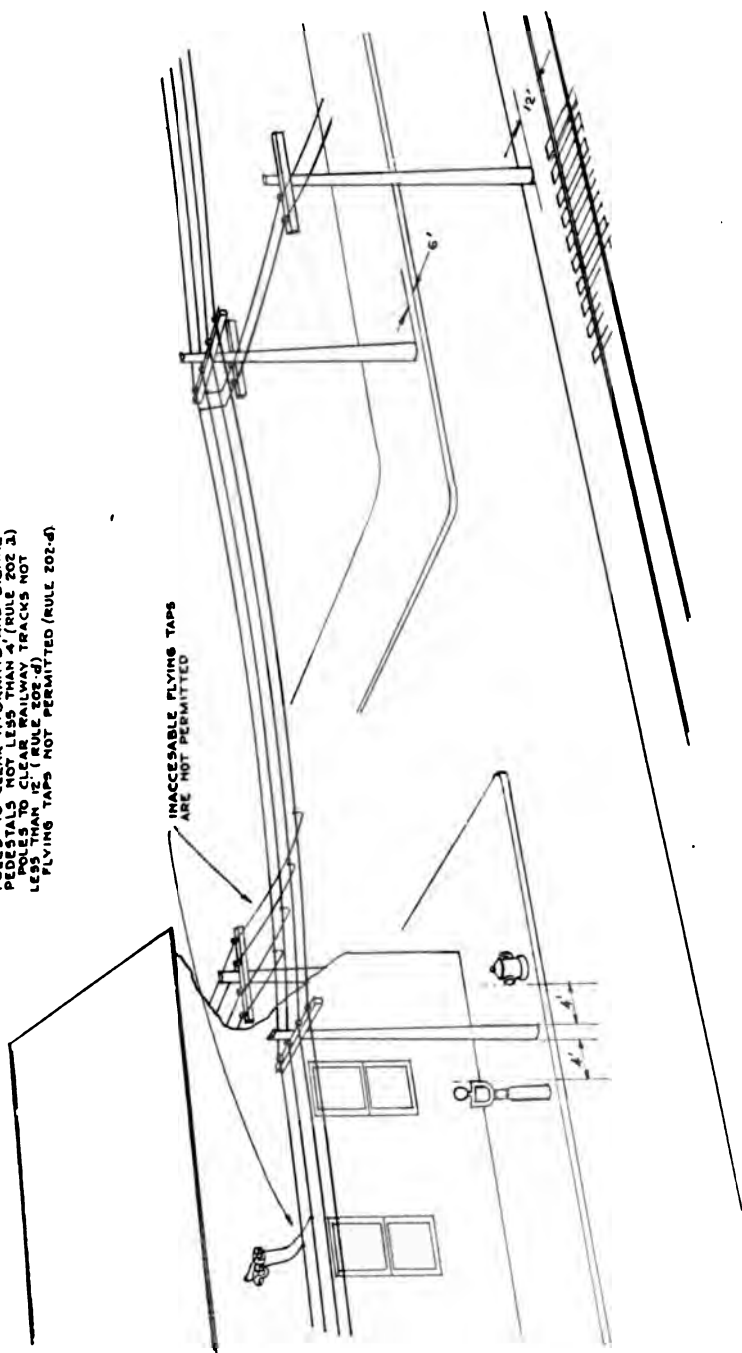


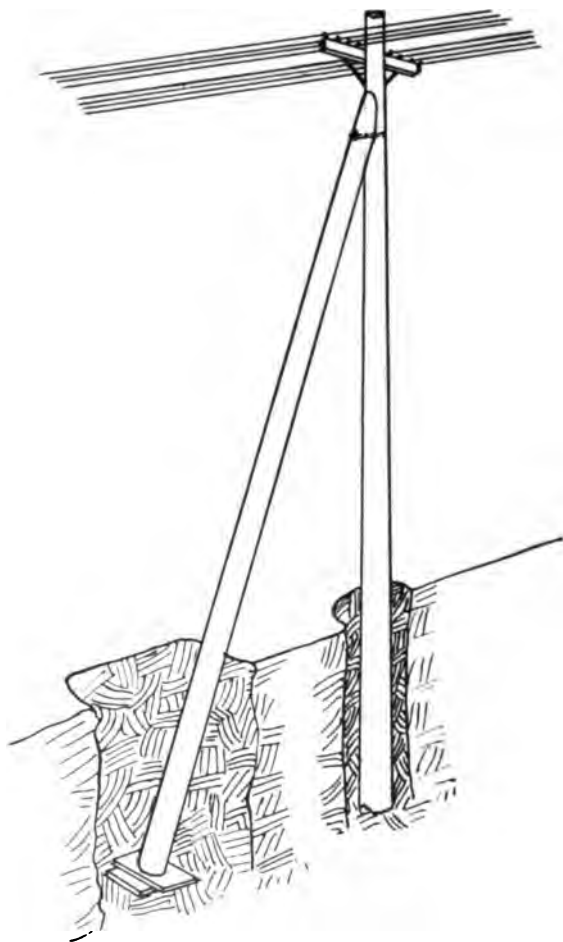
FIG. 1.

LINE M IS "IN CONFLICT" WITH LINE N IF LINE M IN OVERTURNING WILL STRIKE THE WIRES OF LINE N. LINE M IS NOT "IN CONFLICT" WITH LINE O IF LINE O IS ACROSS A ROAD AND AT A DISTANCE NOT LESS THAN $\frac{1}{2}$ THE HEIGHT OF THE POLES OF LINE M AND NOT LESS THAN 20 FEET. (RULE 101)

FIG 2.

POLES TO CLEAR HYDRANTS AND SIGNAL
PEDESTALS NOT LESS THAN 4' (RULE 202.3)
POLES TO CLEAR RAILWAY TRACKS NOT
LESS THAN 12' (RULE 202.4)
FLYING TAPS NOT PERMITTED (RULE 202.6)



**FIG. 3.**

**POLE BRACES MAY BE USED TO
TAKE THE PLACE OF GUYS.
(RULE 203-2)**

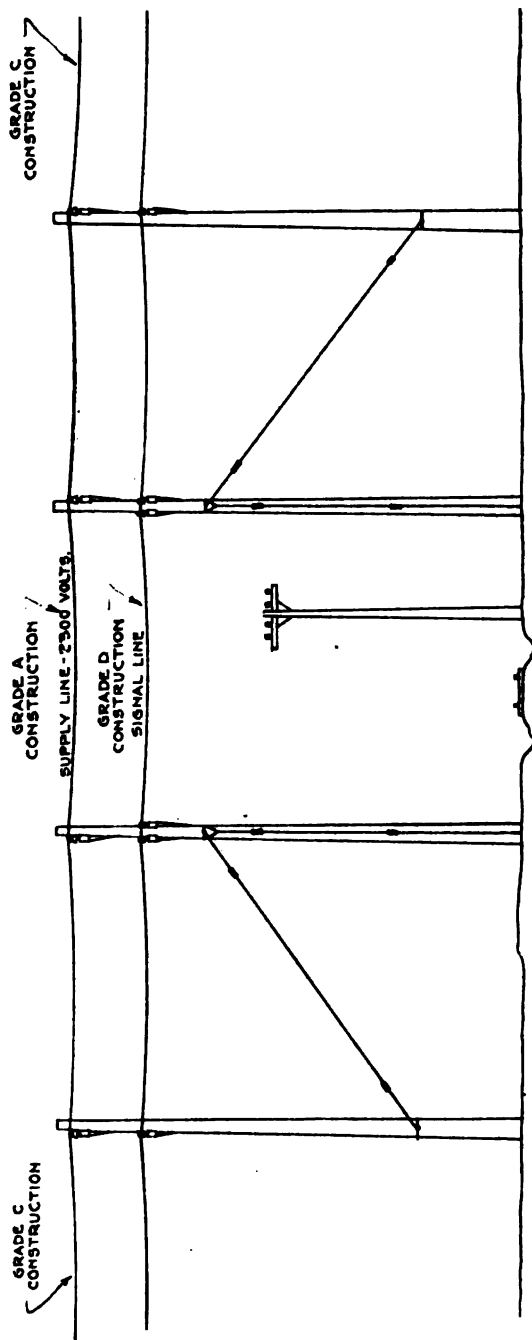
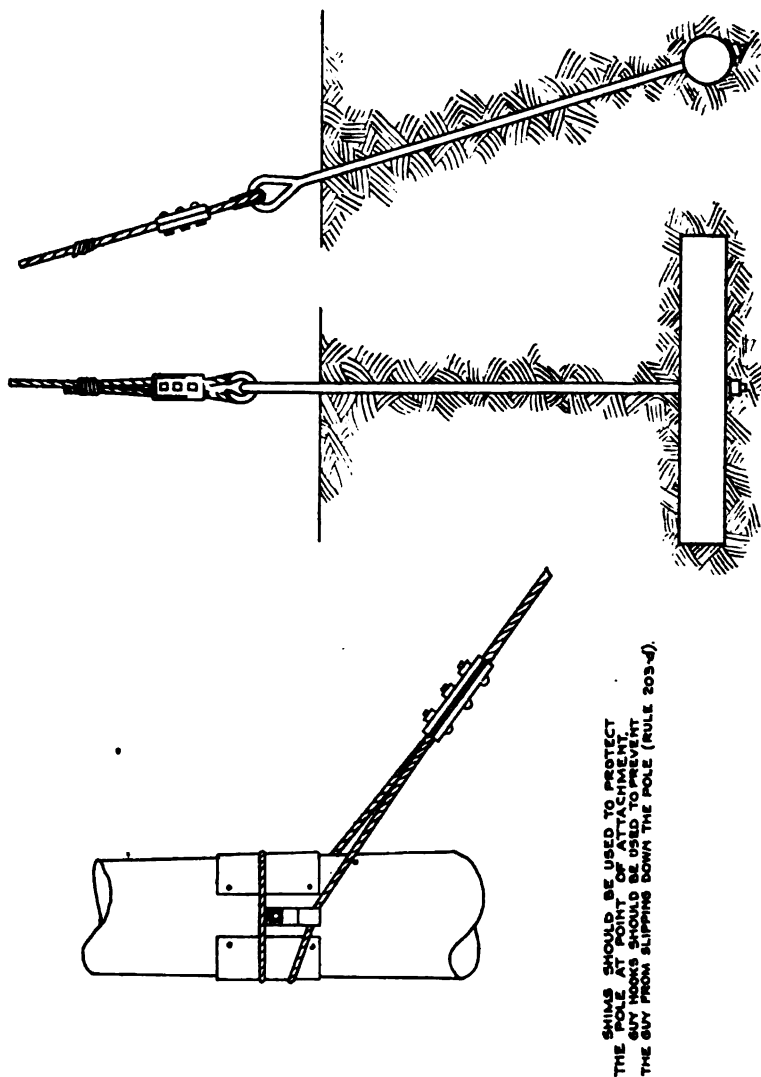


FIG. 4.

GUYS SHOULD BE PLACED WHEREVER CONDUCTOR STRESSES ARE NOT BALANCED, AS CORNER ANGLES, DEAD ENDS, AND CHANGES IN GRADE OF CONSTRUCTION. (RULE 203-b).



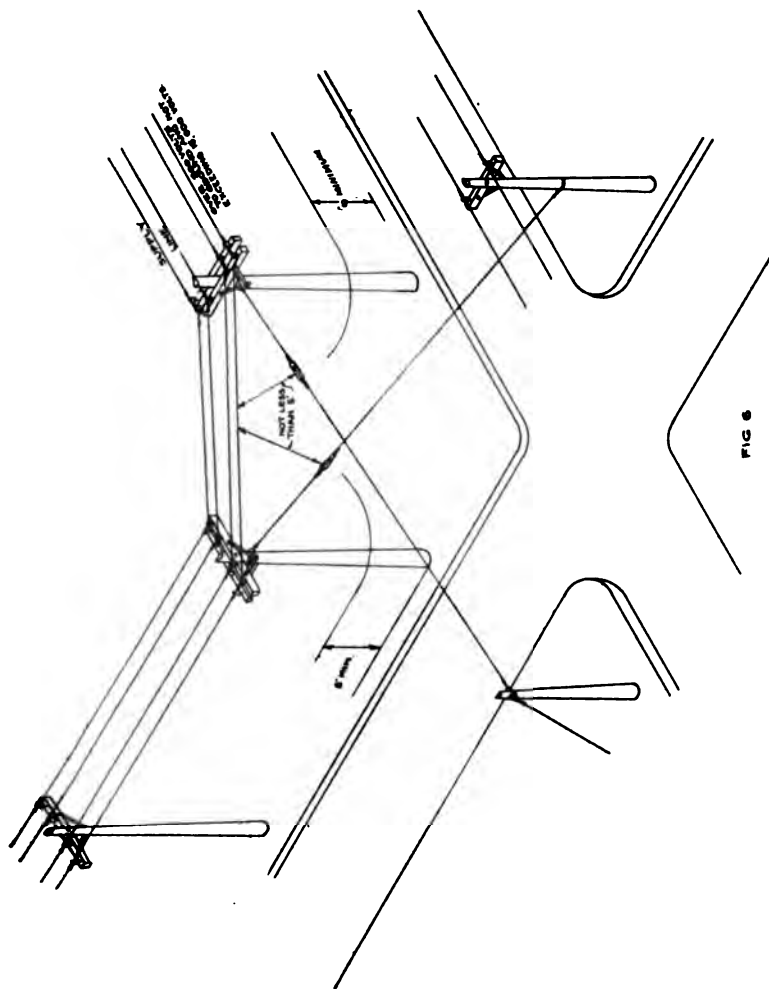


FIG. 6

INSULATORS SHOULD BE INSTALLED IN LINE AT EACH POINT WHERE THE LINE CHANGES DIRECTION OR WHERE THE LINE IS TO BE JOINED TO ANOTHER LINE (RULE 204-a)
CONDUCTOR SHOULD BE NOT LESS THAN 6' ABOVE GROUND AND NOT LESS THAN 5' FROM ANY CONDUCTOR OVER 300 VOLTS TO GROUND (RULE 204-b)

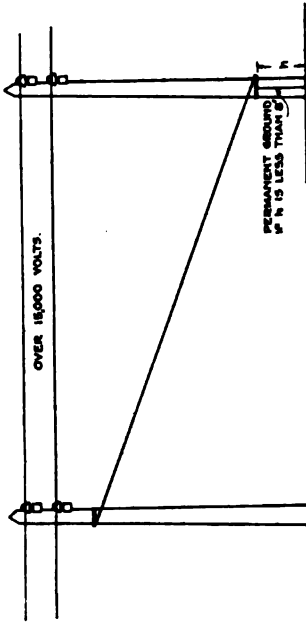


FIG. 7.

PERMANENT GROUND ON ANCHOR END OF GUYS
UNLESS THE LINE IS UNDER 15,000 VOLTS
OR THE GUYS ARE 15,000 VOLTS UNLESS PROVIDED WITH
INSULATOR TO WITHSTAND MAXIMUM VOLTAGE.
(RULE 204 C)

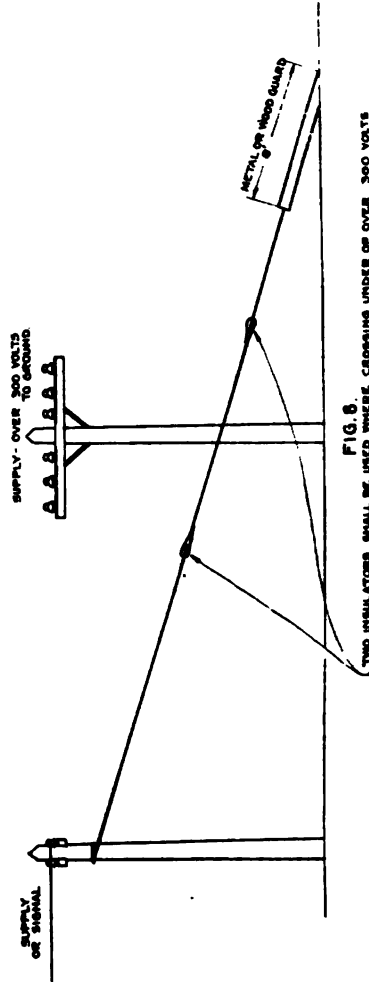


FIG. 8.

TWO INSULATORS SHALL BE USED WHERE CROSSING UNDER OR OVER 300 VOLTS
TO GROUND. INSULATORS SHALL BE PROVIDED WITH INSULATORS (RULE 204 B)
REQUIRED TO TRAFFIC TO BE PROVIDED WITH CONSPICUOUS WOOD OR METAL GUARD (RULE 204 D)

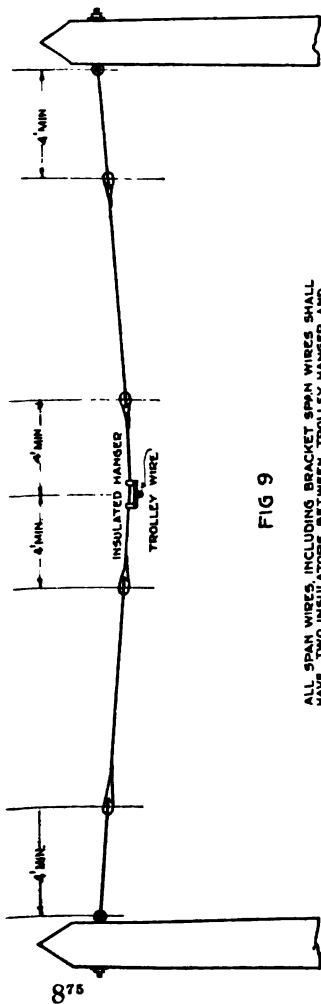


FIG 9

ALL SPAN WIRES, INCLUDING BRACKET SPAN WIRES SHALL HAVE TWO INSULATORS BETWEEN TROLLEY HANGER AND POLE, TO BE 4' FROM THE POLE AND TROLLEY CONDUCTORS RESPECTIVELY (RULE 204-2).

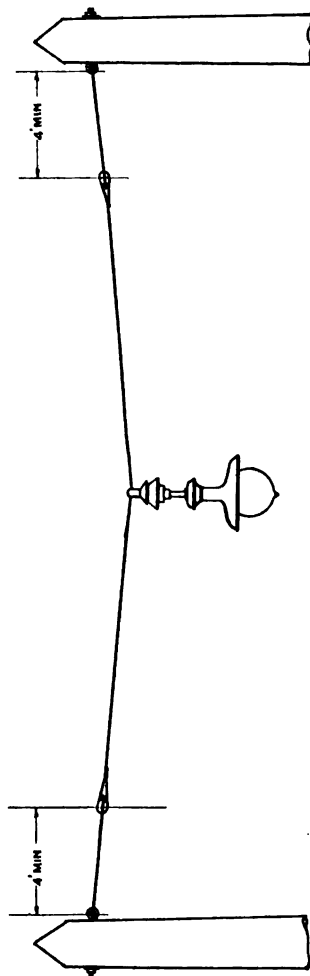


FIG 10.

SPAN WIRES SUPPORTING CONSTANT CURRENT LAMP
FIXTURES SHALL HAVE INSULATORS BETWEEN EACH
POINT OF SUPPORT OF THE SPAN WIRE AND THE
LIGHTING FIXTURE (RULE 204.8)

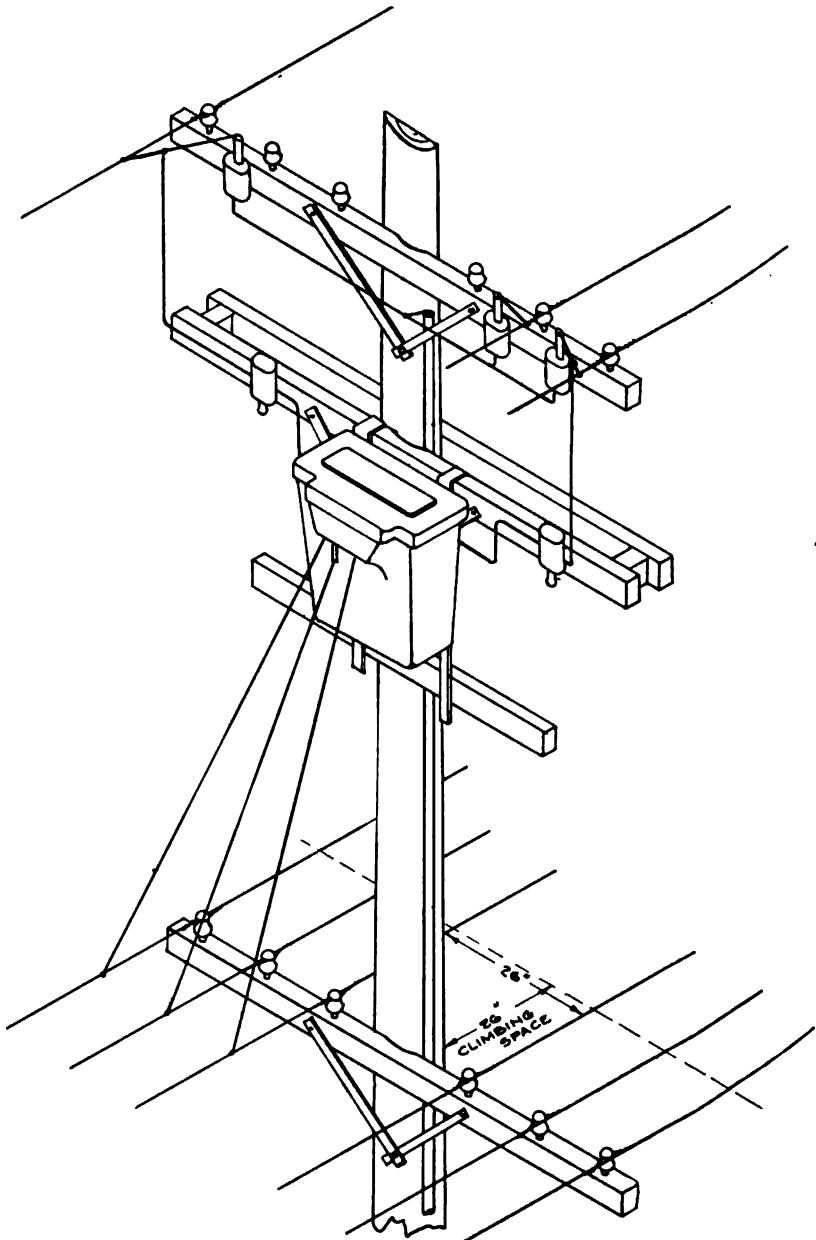


FIG 11.

TRANSFORMERS, LIGHTNING ARRESTERS, REGULATORS, AND SWITCHES SHALL BE PLACED ON THE OPPOSITE SIDE OF THE POLE FROM THE CLIMBING SPACE (RULE 205-B)

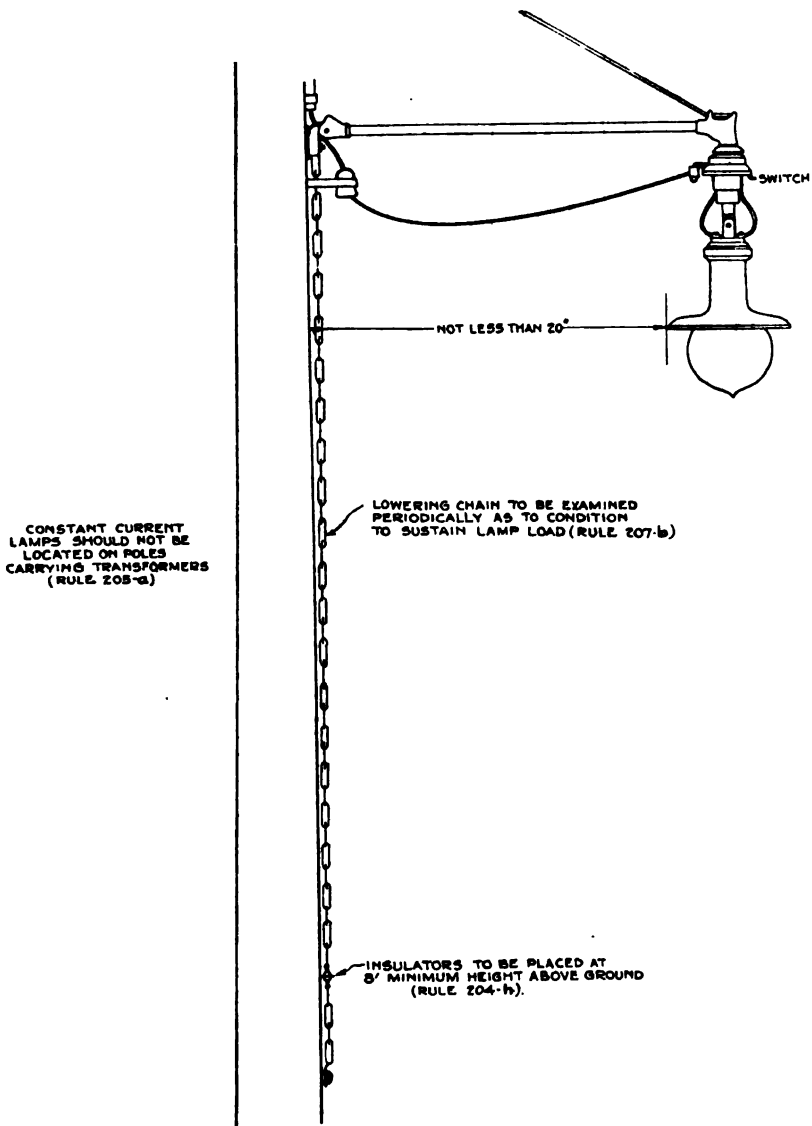


FIG 12

ALL EXPOSED METAL PARTS OF STREET LAMPS SHALL BE AT LEAST 20" FROM POLE SURFACE, EXCEPT THAT WHEN LAMP IS MAINTAINED ON THE SIDE OF THE POLE OPPOSITE THE CLIMBING SPACE THE CLEARANCE MAY BE REDUCED TO 8" (RULE 207-g).
EFFECTIVE INSULATORS SHALL BE PLACED IN THE LOWERING CHAIN (RULE 204-h).
LAMPS ON SERIES CIRCUITS OF OVER 500 VOLTS TO GROUND SHALL BE PROVIDED WITH A SWITCH (RULE 207-c).

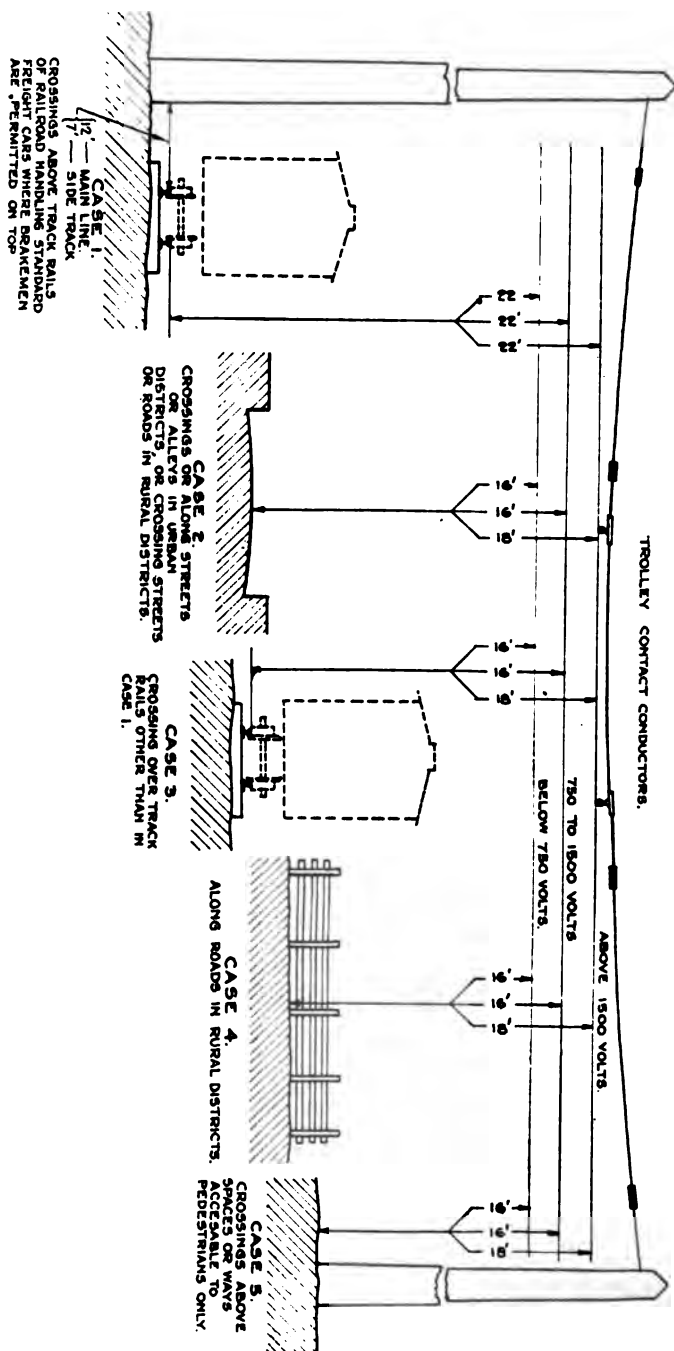


FIG 13.

RULE 301-3.

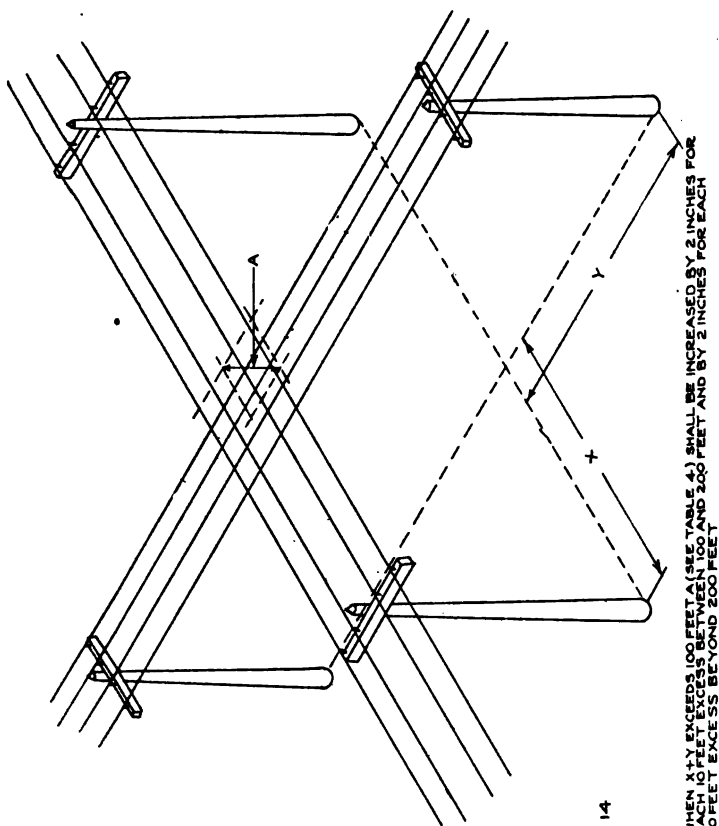
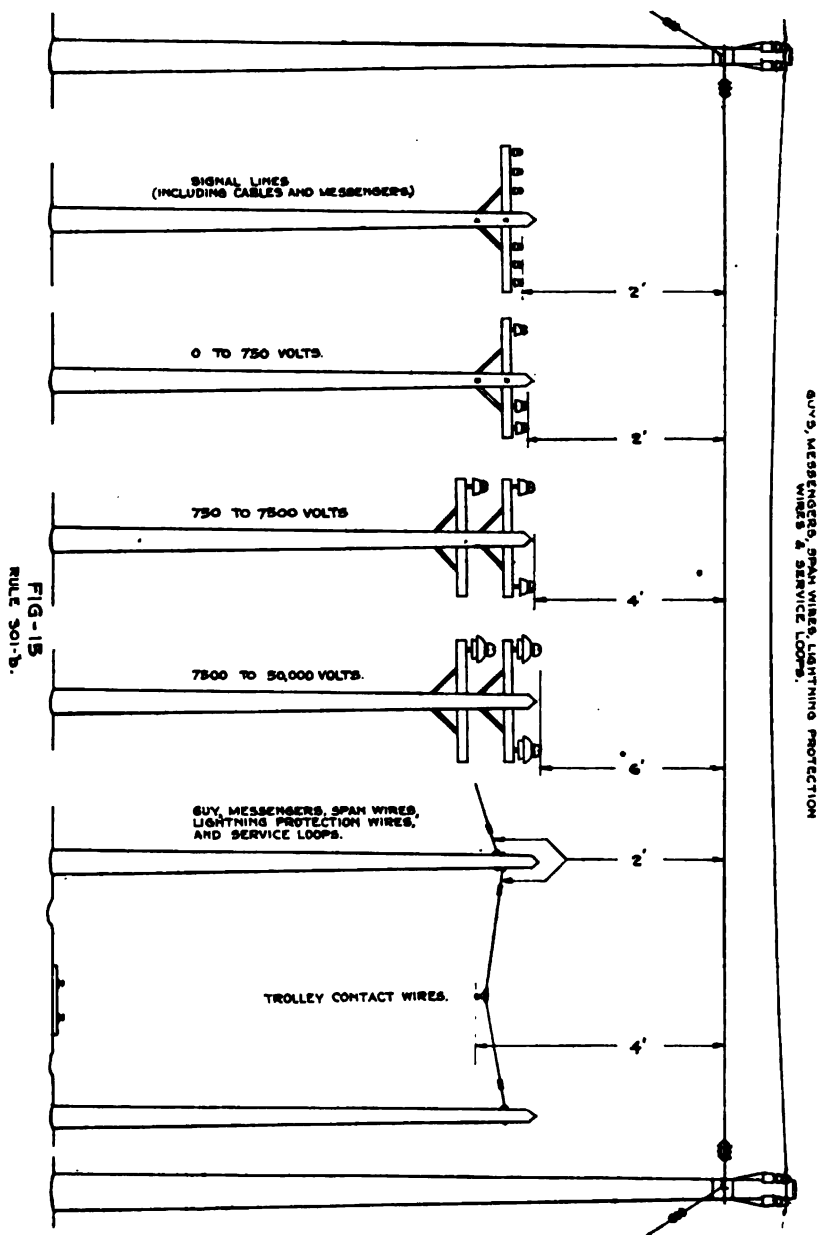
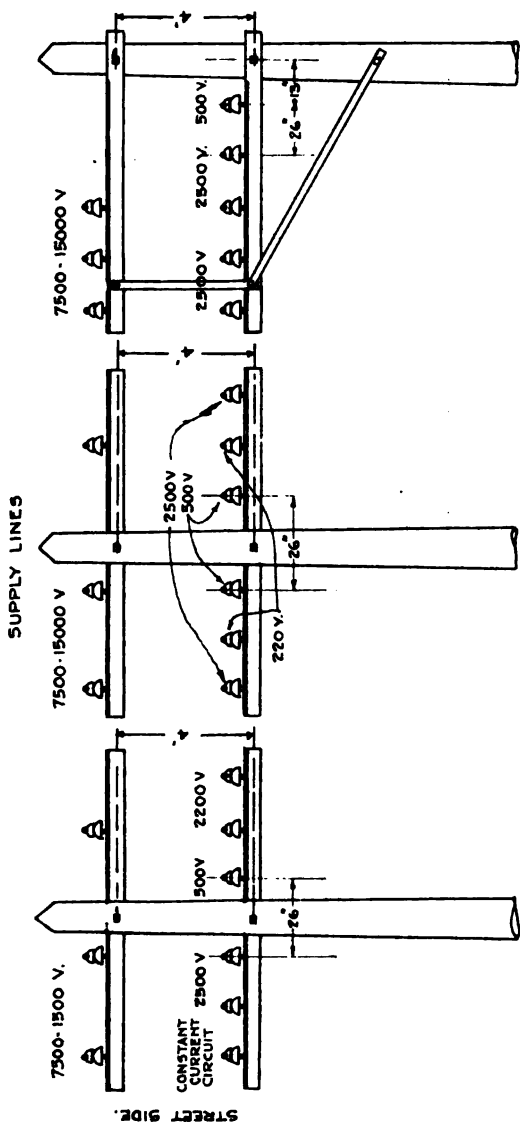


FIG. 14

WHEN $x+y$ EXCEEDS 100 FEET (SEE TABLE 4.) SHALL BE INCREASED BY 2 INCHES FOR EACH 10 FEET EXCESS BETWEEN 100 AND 200 FEET AND BY 2 INCHES FOR EACH 20 FEET EXCESS BEYOND 200 FEET

RULE 301-b-1





SUPPLY LINES OF ANY ONE VOLTAGE CLASSIFICATION MAY BE MAINTAINED ON THE SAME CROSSARM WITH
 SUPPLY LINES OF NEXT CONSECUTIVE CLASSIFICATION:

(1) WHEN THEY OCCUPY PIN POSITIONS ON OPPOSITE SIDES OF POLE

(2) IF IN BRIDGE ARM CONSTRUCTION THEY ARE SEPARATED BY A DISTANCE AS GREAT AS THE CLIMBING SPACE REQUIRED BY RULE 306.

(3) WHEN HIGHER VOLTAGE CIRCUITS OCCUPY OUTER PIN POSITIONS

(4) CONSTANT CURRENT CIRCUITS TO BE ON OUTER PIN ON STREET SIDE OF POLE.

FIG 16.
 ILLUSTRATING RULE 302b

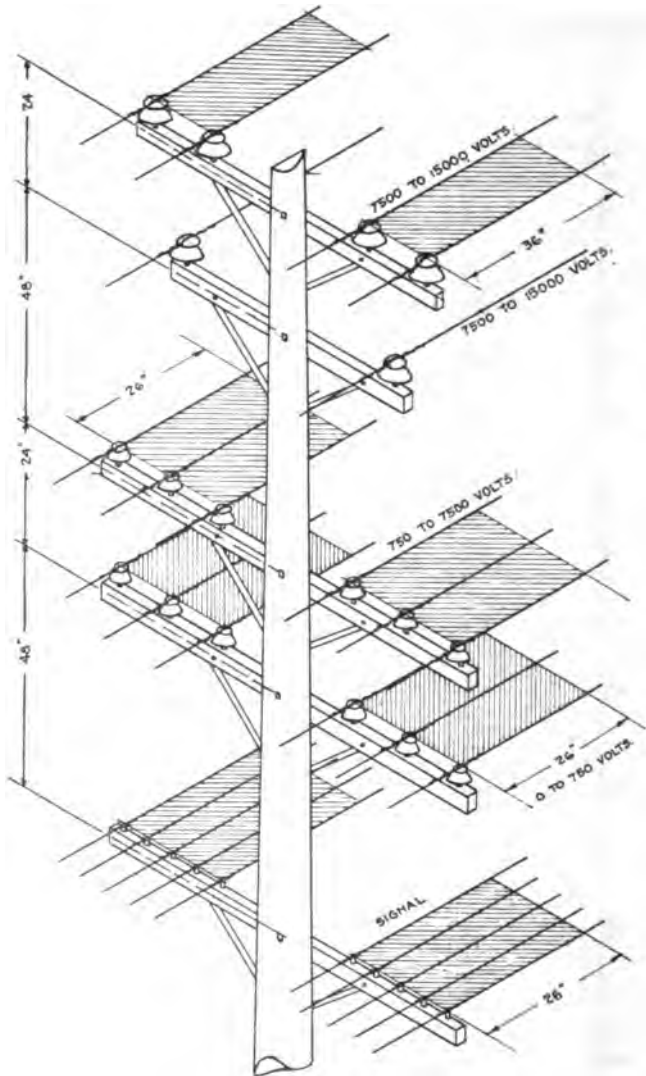


FIG. 17.

LATERAL WORKING SPACE AND VERTICAL SEPARATION
BETWEEN CONDUCTORS AT DIFFERENT LEVELS (ON THE SAME STRUCTURE)

MINIMUM VERTICAL CLEARANCE, 2 FEET

SHADING SHOWS LATERAL WORKING SPACE. NO CONDUCTORS SHALL OBSTRUCT THIS SPACE. WHERE
LINES ARE NOT WORKED ON ALIVE, ABOVE SEPARATIONS ARE NOT REQUIRED. (SEE TABLE B & 4
RULES 304 & 306.)

BUCKARMS

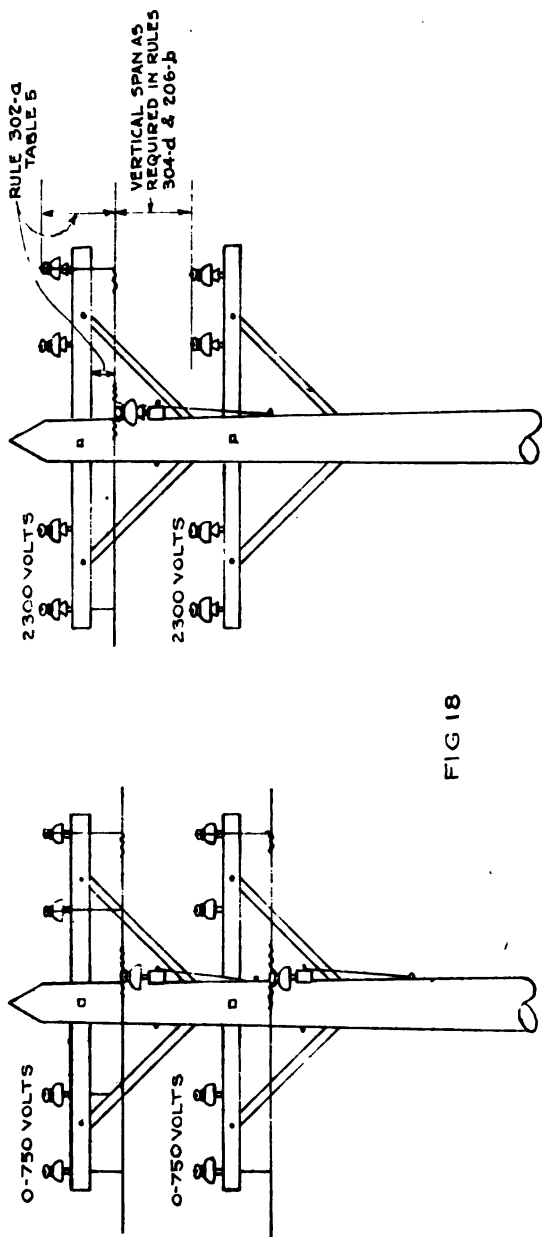


FIG 18

ONLY ONE BUCKARM CAN BE USED ON A POLE WHEN SUPPLY VOLTAGE IS ABOVE 750 VOLTS UNLESS FULL VERTICAL SEPARATION AS IN FIG 17 IS PROVIDED BETWEEN CONDUCTORS (RULE 304-d)

MORE THAN ONE BUCKARM CAN BE USED

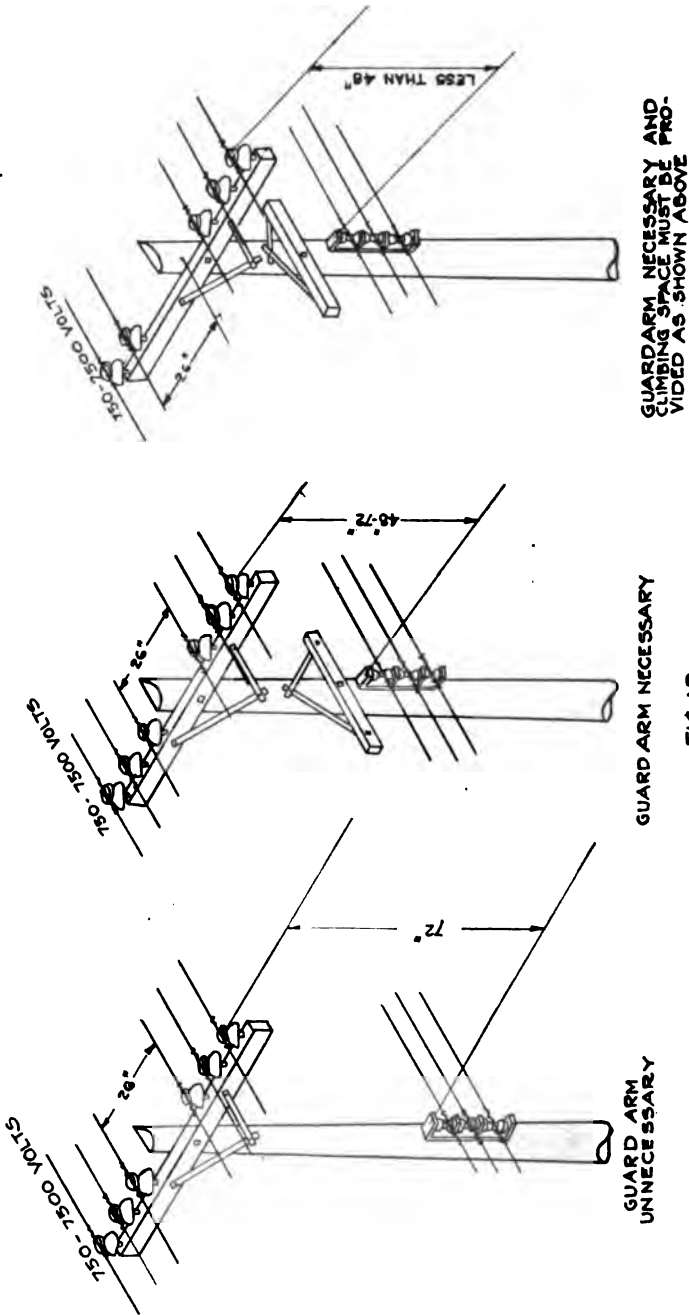


FIG.19

NOTE: VERTICAL SPACINGS DO NOT APPLY TO LINES OF VOLTAGE LESS THAN 750 IN CONNECTION WITH VERTICAL RACKS FOR CLIMBING. SPACINGS ARE NOT REQUIRED FOR LINES HAVING VOLTAGE GREATER THAN 80 FEET, PROVIDED FULL CLIMBING SPACE IS PROVIDED 4 FEET ABOVE AND BELOW. SEE RULES 8041, 8061h.

CONDUCTORS OF DIFFERENT SAGS UPON SAME SUPPORTS

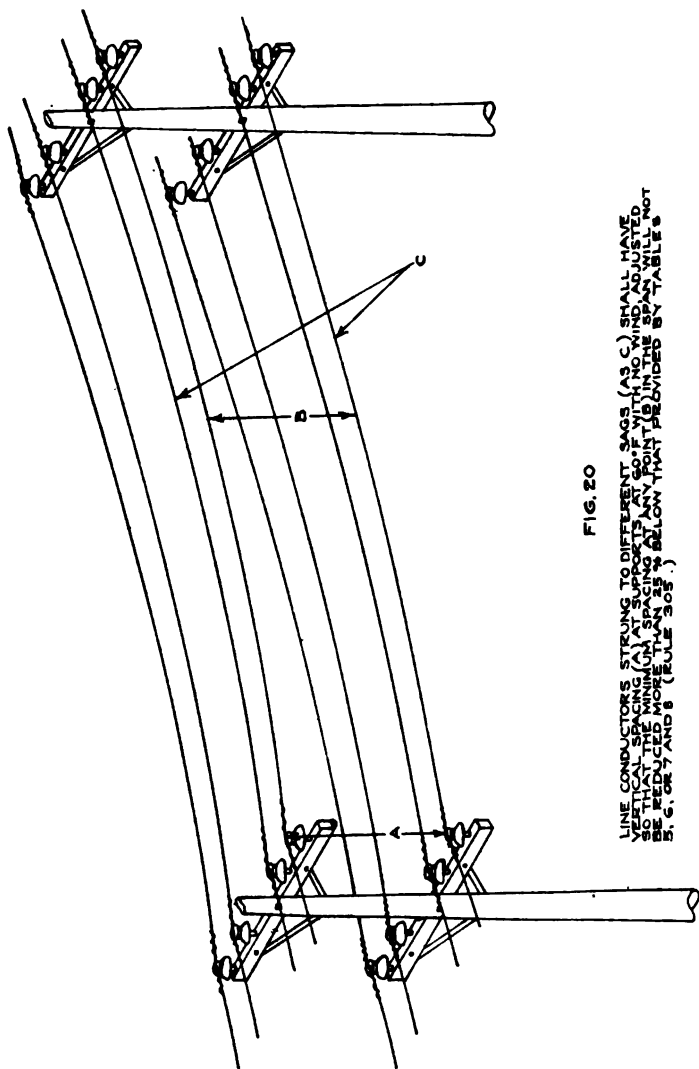


FIG. 20

LINE CONDUCTORS STRUNG TO DIFFERENT SAGS (AS C) SHALL HAVE SPACING SUCH THAT THE MINIMUM SPACING AT ANY POINT IN THE SPAN WILL NOT BE REDUCED MORE THAN 25% BELOW THAT PROVIDED BY TABLES 5, 6, OR 7 AND 8 (RULE 305.)

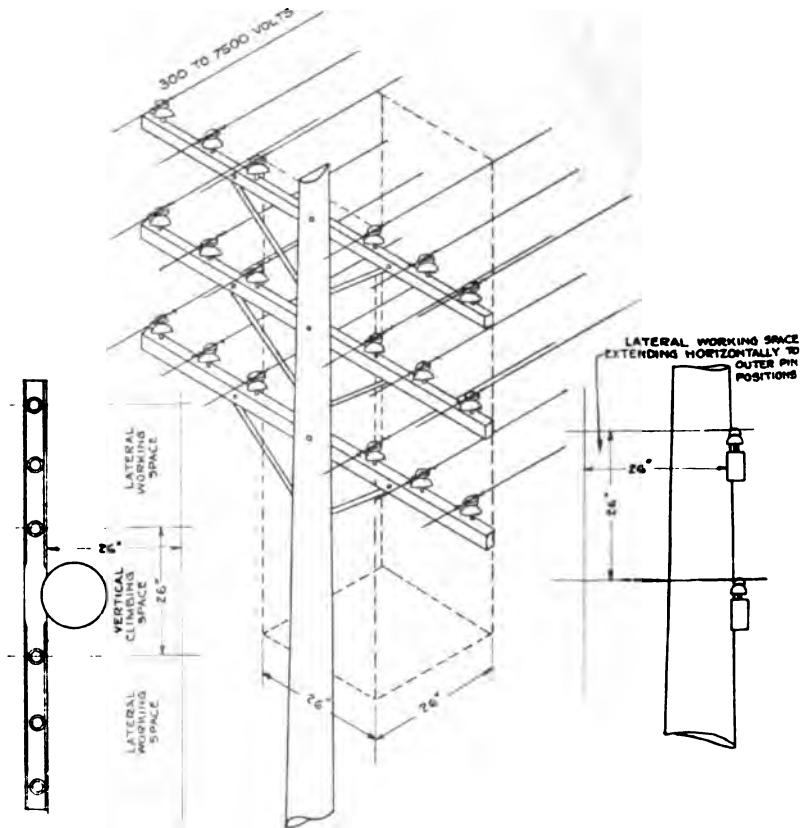


FIG. 21.

NOTE:

CLIMBING SPACE TO BE PROVIDED ON ONE SIDE OR CORNER ONLY OF THE POLE STRUCTURE. WHERE SUPPLY CONDUCTORS ARE LESS THAN 300 VOLTS TO GROUND ONLY 24 INCH CLIMBING SPACE IS REQUIRED. CLIMBING SPACE FOR LINES ABOVE 7500 VOLTS SHALL BE INCHES (RULE 306-2)

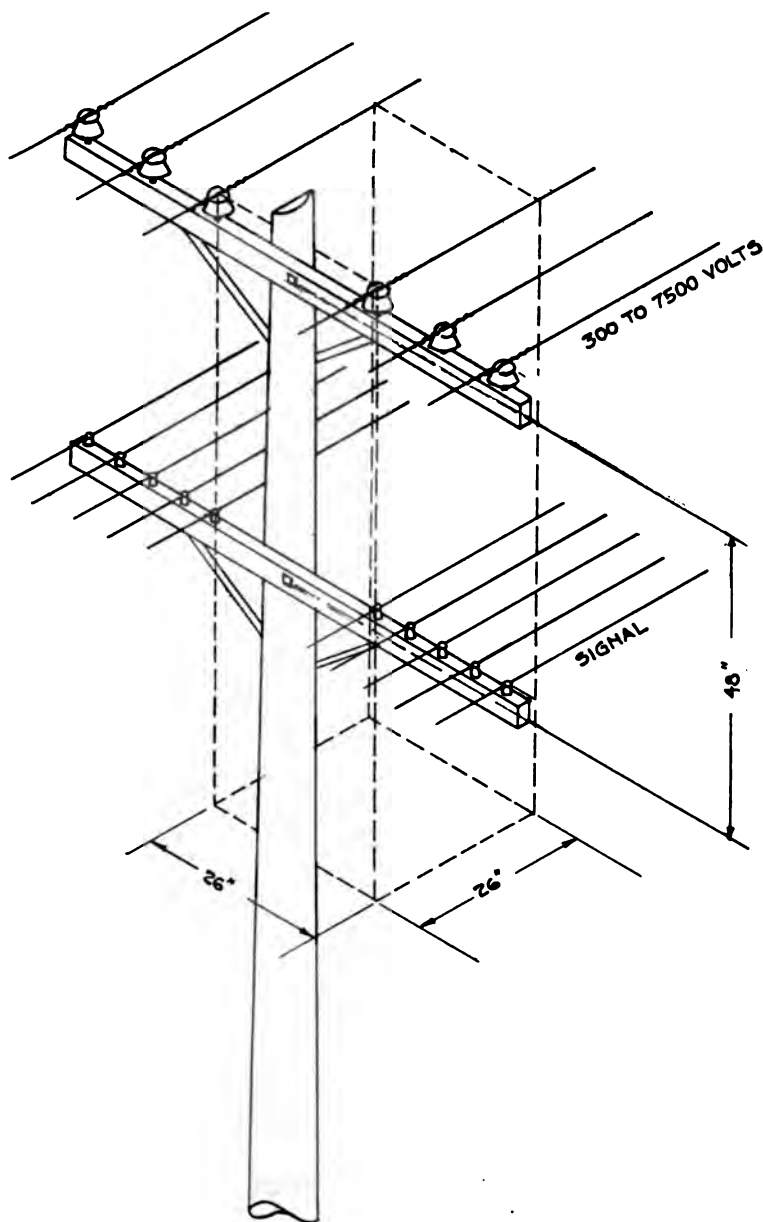
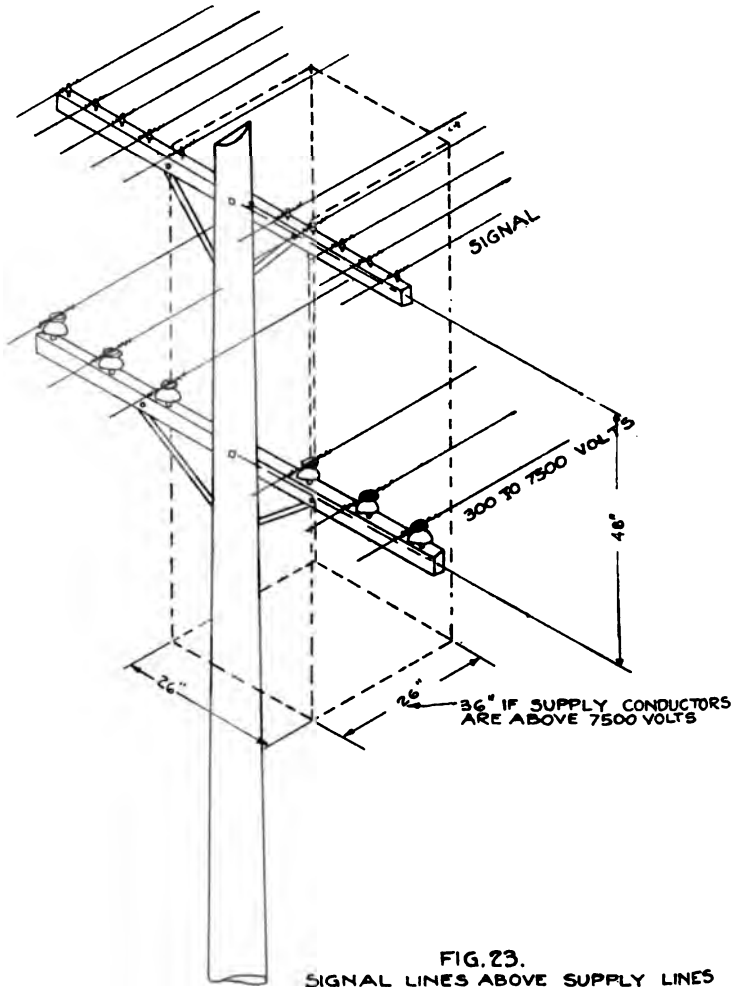


FIG. 22

SIGNAL LINES BELOW SUPPLY LINES.

NOTE: THE SIGNAL LINES SHALL PROVIDE SAME CLIMBING SPACE AS IS REQUIRED FOR SUPPLY CONDUCTORS. (RULE 306-C)

**NOTE:**

THE CLIMBING SPACE REQUIRED FOR THE SUPPLY CONDUCTORS SHALL EXTEND 48" ABOVE THE HIGHEST SUPPLY CONDUCTOR AND AT LEAST 72" ABOVE WHEN THE SUPPLY CONDUCTORS EXCEED 7500 VOLTS - CLIMBING SPACE (RULE 306-d)

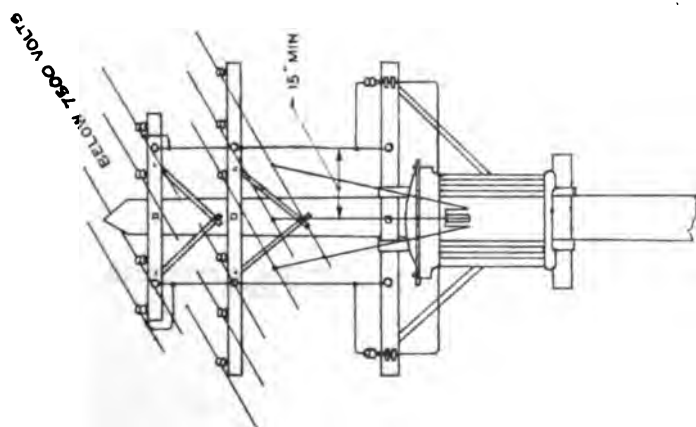


FIG 24

VERTICAL CONDUCTOR CLEARANCE
FROM CENTER OF POLE IS SHOWN ABOVE
(RULE 307 'b)

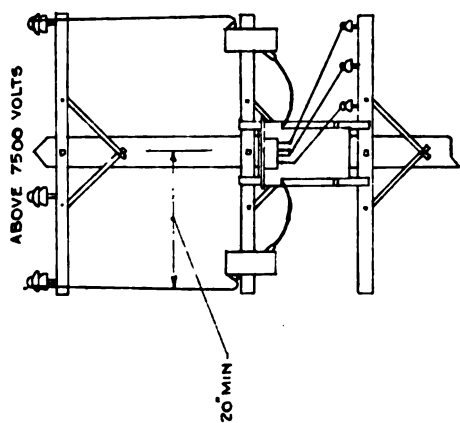


FIG 25

VERTICAL CONDUCTOR CLEARANCE
FROM CENTER OF POLE IS SHOWN ABOVE
(RULE 307 'b)

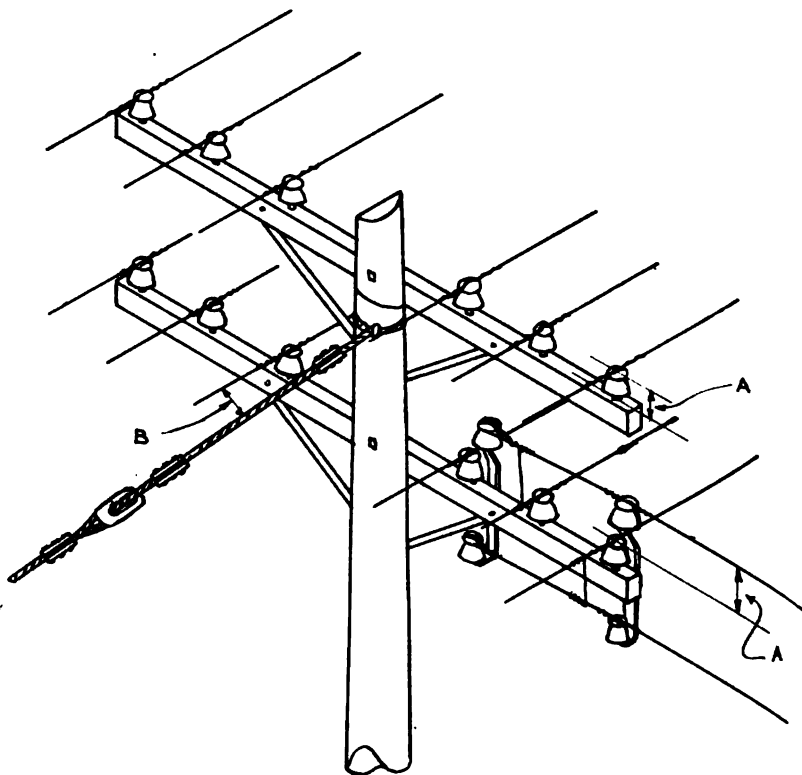


FIG. 26.
MINIMUM CLEARANCES OF VERTICAL & LATERAL CONDUCTORS
SUPPLY CIRCUITS ABOVE 7500 VOLTS.

- CLEARANCE A** - $3' + 0.2"$ PER K.V. (HIGHEST VOLTAGE CONCERNED)
 OVER 7500 VOLTS. (SEE EXCEPTIONS TABLE 5.)
- CLEARANCE B** - $6' + 0.2"$ PER K.V. (HIGHEST VOLTAGE CONCERNED)
 OVER 7500 VOLTS. (RULE 307-d)

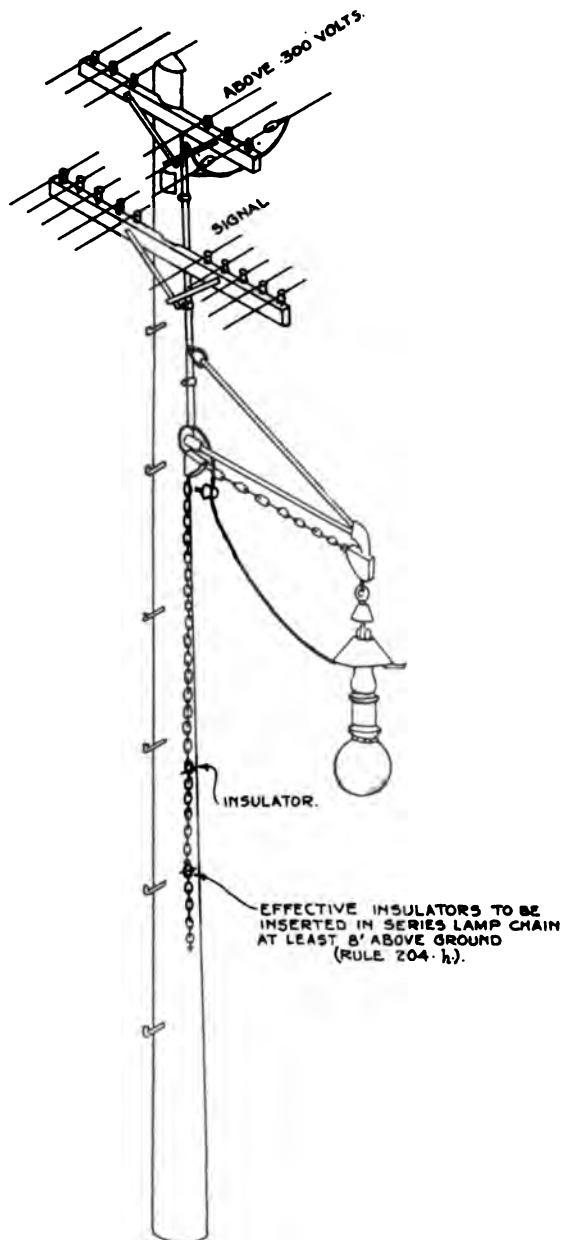


FIG. 27.

CONDUIT IS NECESSARY FOR VERTICAL CONDUCTORS IN ABOVE BECAUSE VOLTAGE IS GREATER THAN 300 VOLTS TO GROUND AND BECAUSE OF THE PRESENCE OF SIGNAL CONDUCTORS. (RULE 307-e).

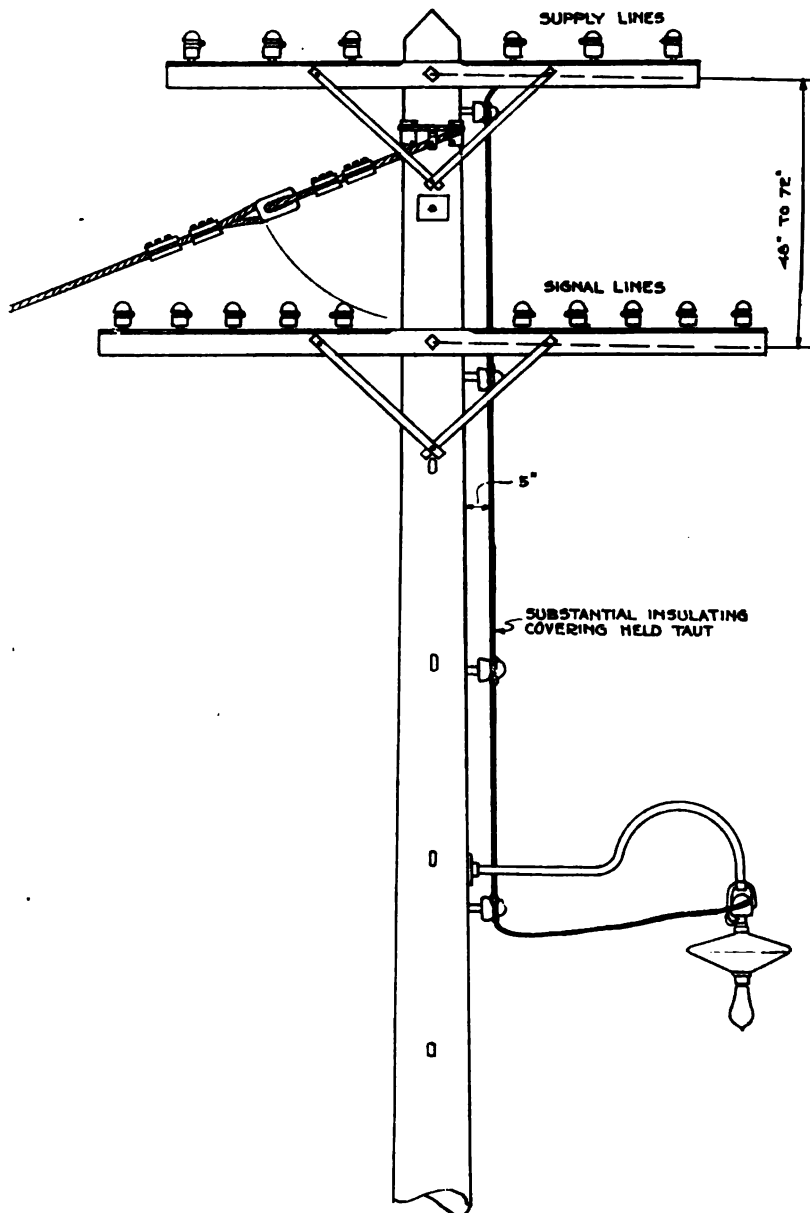


FIG-26.

CONDUIT IS NOT NECESSARY FOR VERTICAL CONDUCTORS TO STREET LIGHTS IN ABOVE WHEN SUITABLE INSULATION IS PROVIDED AND WHEN THE VERTICAL CIRCUIT IS LESS THAN 750 VOLTS TO GROUND AND THE POLE IS STEPPED TO THE LOWEST CROSSARM.
IF POLE IS USED FOR SUPPLY LINES ONLY, THE ABOVE CONSTRUCTION IS PERMITTED FOR VOLTAGES BELOW 7500 VOLTS. (RULE 307-c-1)

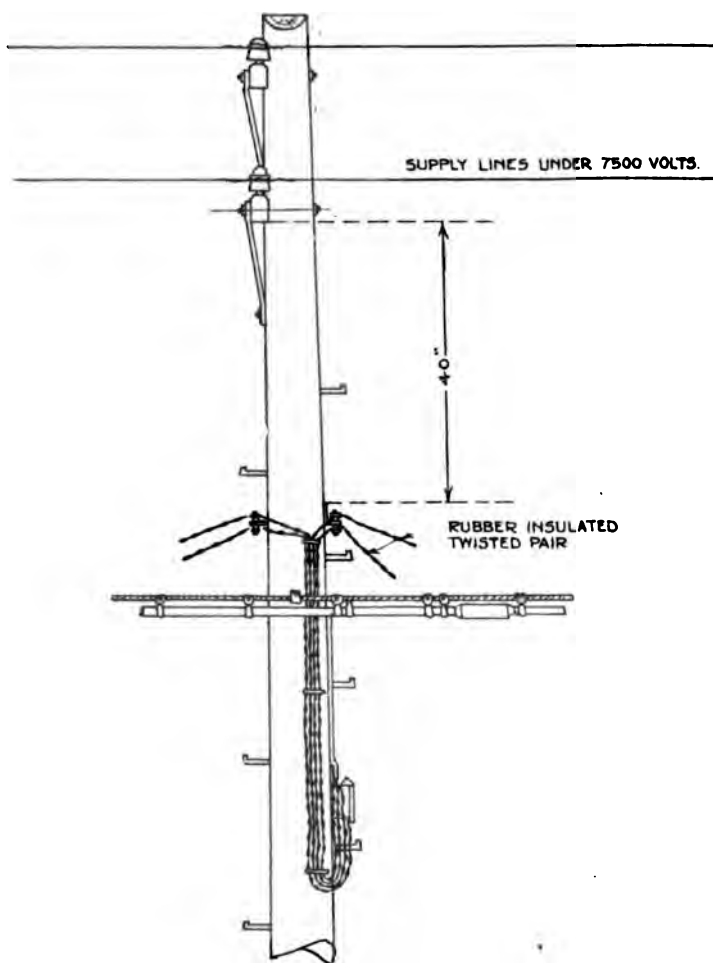


FIG 29.

RUBBER INSULATED TWISTED PAIR CAN BE ATTACHED TO THE SURFACE OF POLES WITH KNOBS OR BRACKETS WHERE SIGNAL LINES ONLY ARE USED ON POLES OR WHERE AT LEAST 48' BELOW THE SUPPLY LINES UNDER 7500 VOLTS. (RULE 307-E-2)

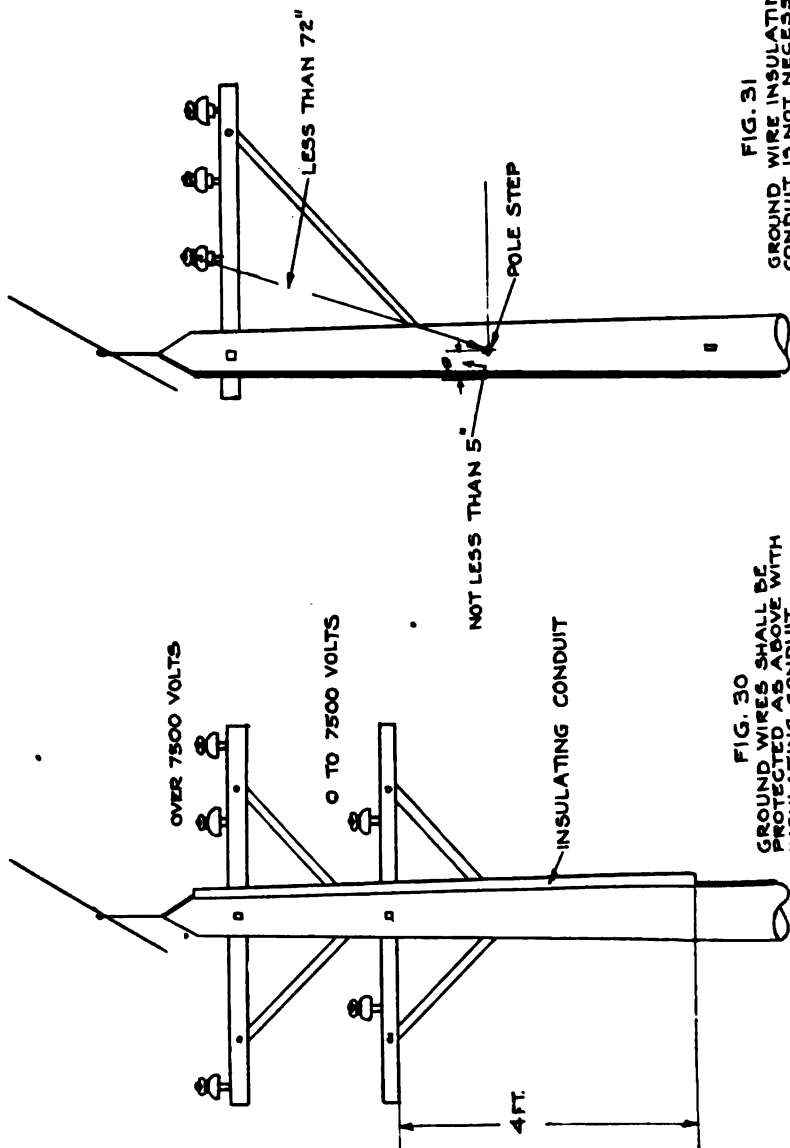


FIG. 30
GROUND WIRES SHALL BE
PROTECTED AS ABOVE WITH
INSULATING CONDUIT
RULE 307-4-1

FIG. 31
GROUND WIRE INSULATING
CONDUIT IS NOT NECESSARY
IN SIDE ARM CONSTRUCTION
AS ABOVE RULE 307-4-2

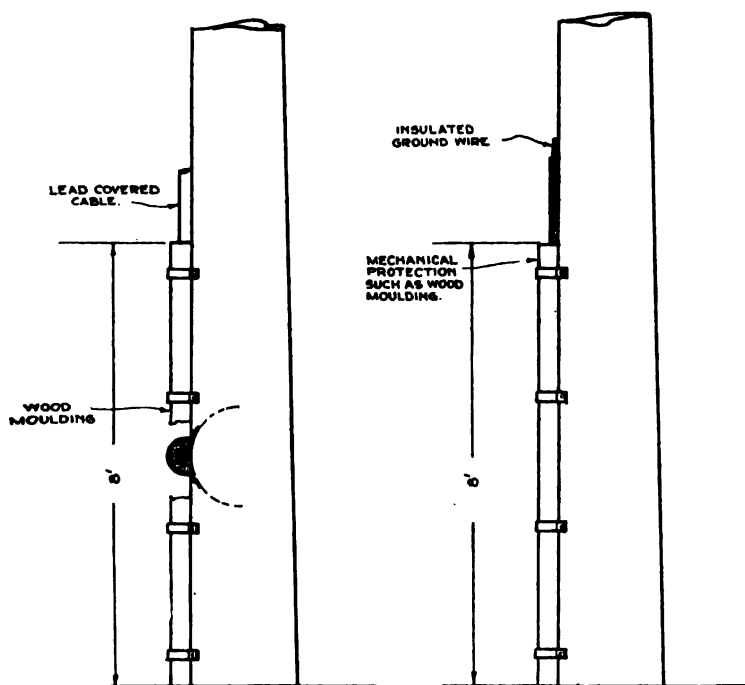


FIG. 32.

MECHANICAL PROTECTION TO BE USED ON GROUND WIRE AND METAL SHEATH CABLES 6" FROM GROUND LINE. WHERE ONLY ONE GROUND WIRE TO A LIGHTNING ARRESTER, SAME TO BE OF INSULATING MATERIAL (RULE 307-2)

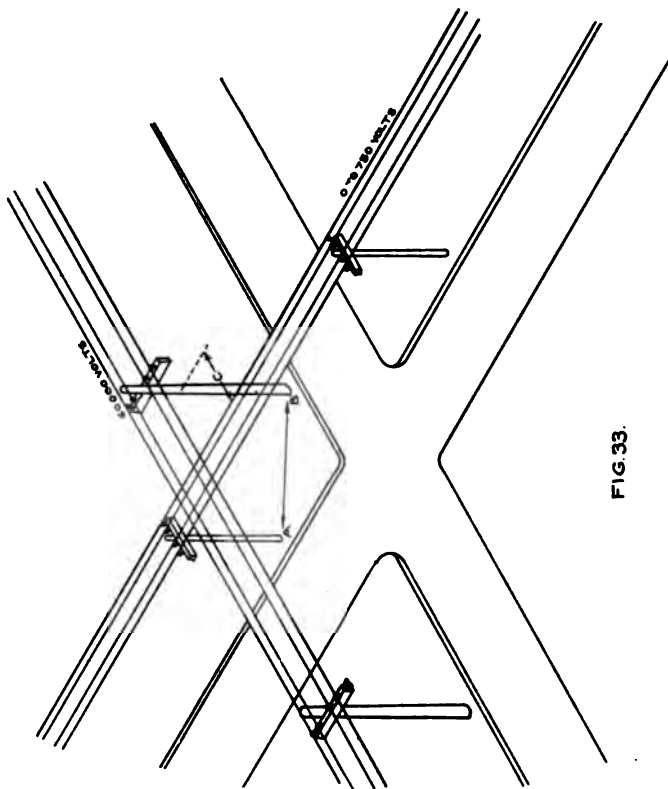


FIG. 33.

NOTE: C MUST BE NO CASE LESS THAN 310"
 C MUST NOT BE LESS THAN REQUIRED BY
 RULES 302, 303 + 1 IN FOR EACH 2 FT OF
 DISTANCE A

RULE 308-a

CLEARANCE FROM BUILDINGS

NO OPEN CONDUCTORS BETWEEN 300 VOLTS TO GROUND AND 7500 VOLTS TO BE RUN THROUGH THE SHADED AREA

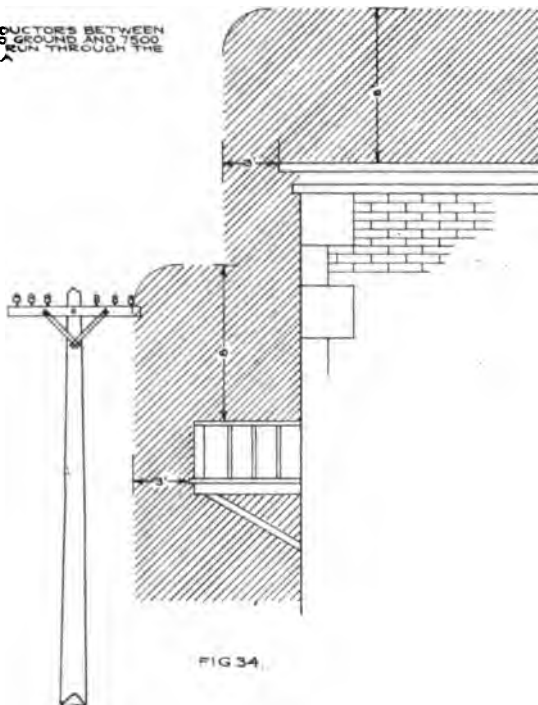


FIG 34

CLEARANCE FOR SUPPLY LINES BETWEEN 7500 AND 15000 VOLTS SHALL CLEAR SURFACES OF ROOFS OR BUILDINGS BY AT LEAST 8' AND FOR OVER 15000 VOLTS BY 10'. THEY SHOULD NOT BE CARRIED OVER BUILDINGS NOT CONCERNED IN THE UTILITY OPERATION (RULE 309-C)

CLEARANCES OF SUPPLY LINES BETWEEN 300 VOLTS TO GROUND AND 7500 VOLTS SHALL BE AT LEAST 3 FEET HORIZONTALLY AND 8 FEET VERTICALLY (RULE 309-C). LADDER SPACE FOR BUILDINGS OVER THREE STORIES HIGH SHOULD BE ARRANGED WITH CLEAR SPACE AT LEAST 6 FEET WIDE EITHER ADJACENT TO THE BUILDING OR BEGINNING NOT MORE THAN 8 FEET FROM IT. (RULE 309-B)

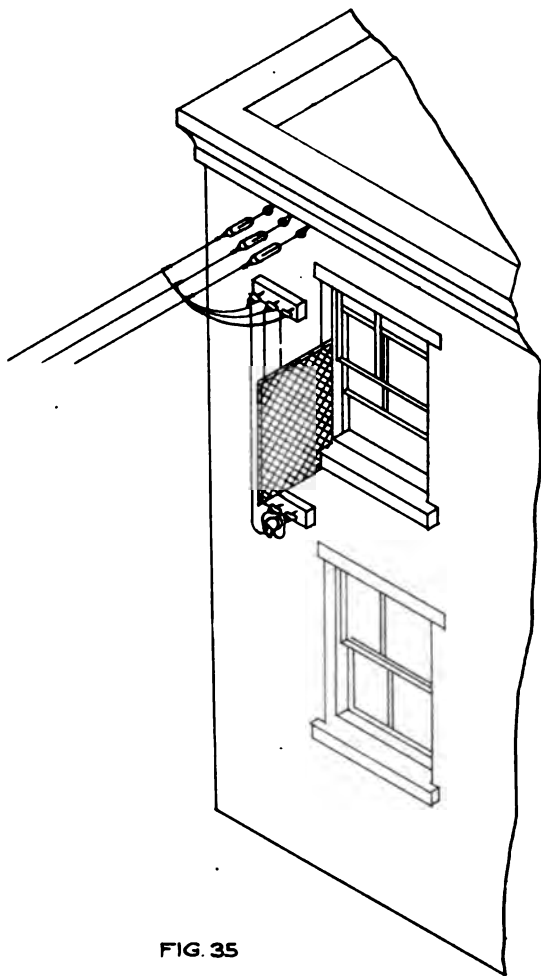


FIG. 35

GUARDS SHALL BE PROVIDED AS SHOWN ABOVE WHERE CONDUCTORS ARE EXPOSED TO CONTACT OF PERSONS AT WINDOWS. WHERE CONDUCTORS OF OVER 300 VOLTS TO GROUND ARE ATTACHED TO BUILDINGS THEY SHALL BE MADE INACCESSIBLE AND SHALL HAVE THE SAME SEPARATIONS AND CLEARANCES OF CONDUCTORS AS IF USED ON POLES (RULES 305-d AND e.)

SPECIAL TRANSVERSE STRENGTH

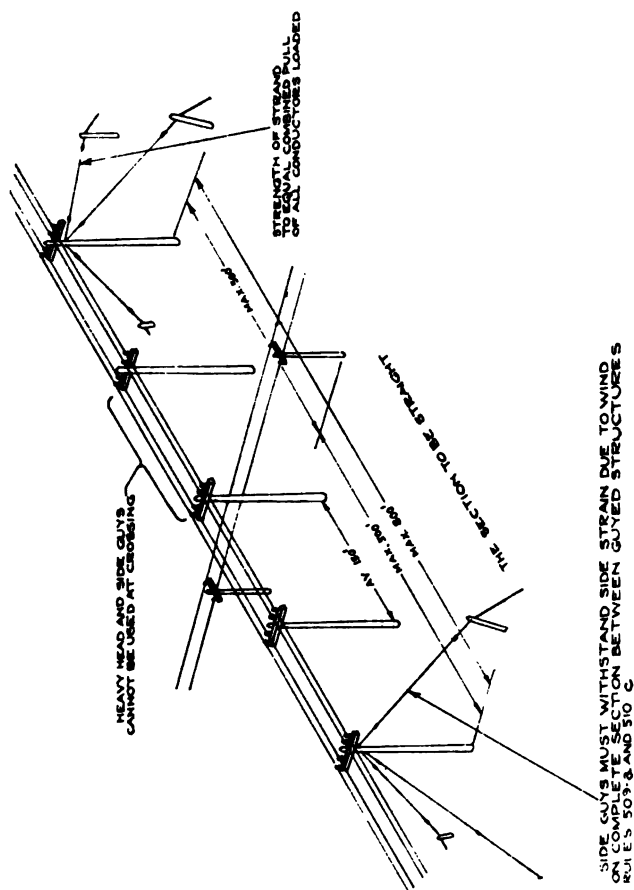


FIG 36

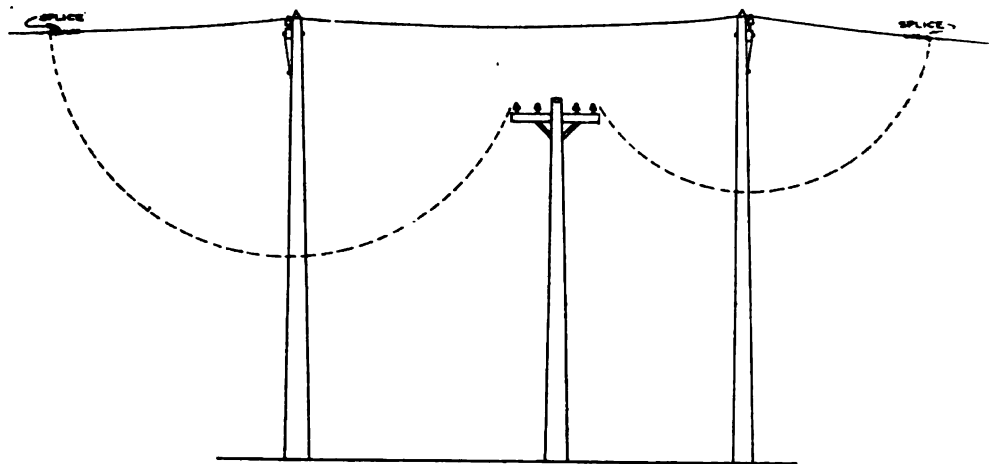


FIG. 37.

RULE 707 &

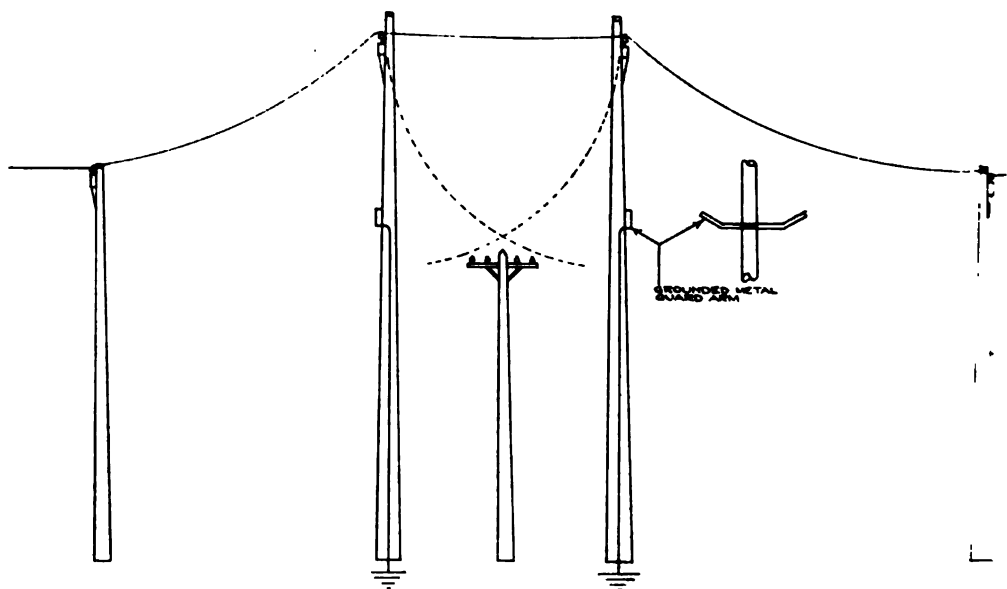
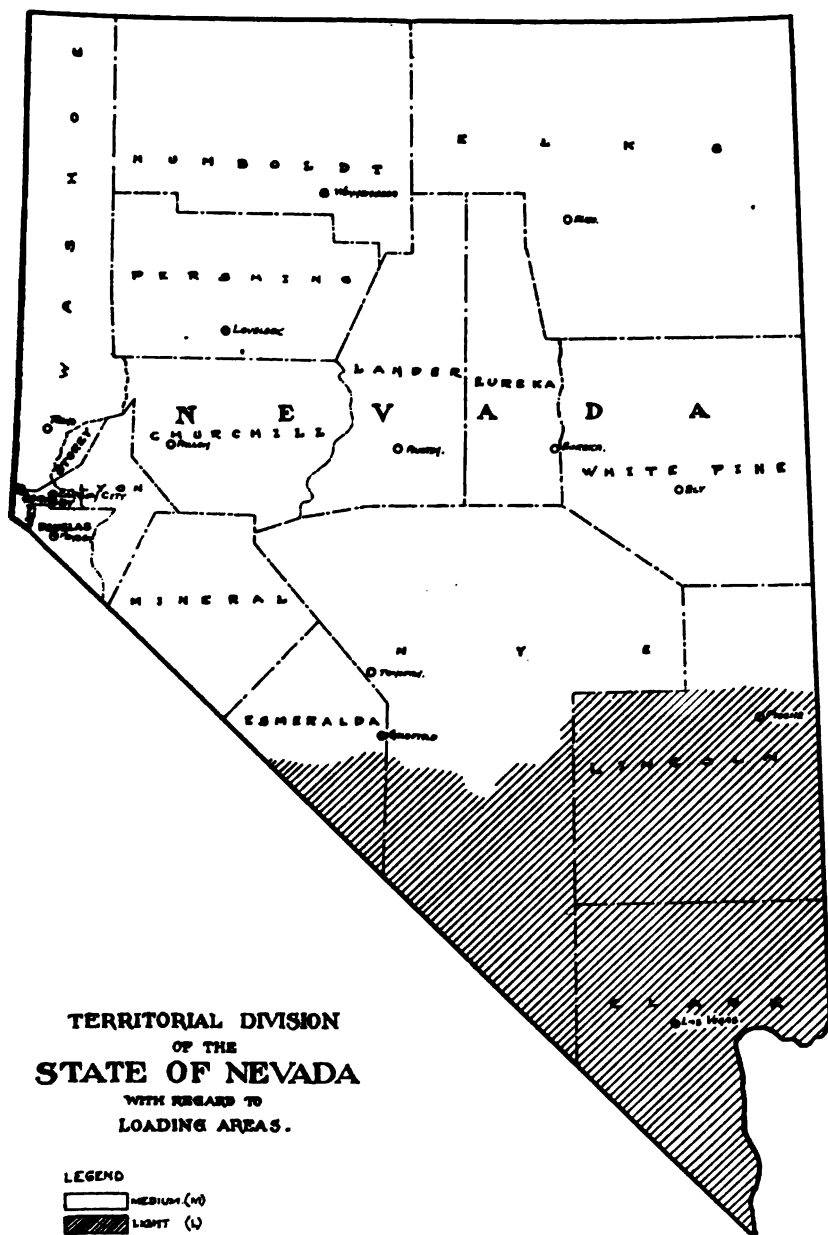


FIG. 38.

SHORT SPAN CONSTRUCTION

APPENDIX D





BEFORE THE PUBLIC SERVICE COMMISSION OF NEVADA

IN RE APPLICATION OF THE SOUTHERN PACIFIC COMPANY, WESTERN PACIFIC RAILROAD COMPANY, LOS ANGELES AND SALT LAKE RAILROAD, NEVADA NORTHERN RAILWAY, NEVADA TRANSPORTATION COMPANY (operating Eureka Nevada Railway), NEVADA CENTRAL RAILROAD, VIRGINIA AND TRUCKEE RAILWAY, NEVADA COPPER BELT RAILROAD, TONOPAH AND GOLDFIELD RAILROAD, TONOPAH AND TIDEWATER RAILROAD, AND THE BULLFROG GOLDFIELD RAILROAD, FOR HORIZONTAL INCREASES OF TWENTY-FIVE PER CENT IN FREIGHT RATES, TWENTY PER CENT IN MILK RATES, TWENTY PER CENT IN PASSENGER FARES, AND FIFTY PER CENT IN PULLMAN FARES COVERING STATE BUSINESS.

C-614

APPEARANCES:

For the Commission—

J. F. SHAUGHNESSY, Chairman,
W. H. SIMMONS, Commissioner,
BENSON WRIGHT, Secretary.

For the Carriers—

GUY V. SHOUP, General Attorney, Southern Pacific Company;
H. C. BOOTH, Attorney for Southern Pacific Company;
LESTER J. HINSDALE, General Attorney, Western Pacific Railroad Company;
FRED E. PITTT, JR., General Attorney, Los Angeles and Salt Lake Railroad.

For the Shippers—

JOHN G. KIRCHEN, for Nevada Mine Operators Association;
S. HERBERT WILLIAMS, for Boston-Ely Con. Mining Co.;
GEORGE H. RYAN, for Forman & Ryan; also for J. W. Walker
of Cherry Creek, Nevada;
J. G. CRUMLEY, for Tonopah-Divide Chamber of Mines;
S. B. ELBERT of Ely, Nevada;
E. H. WALKER, for Reno Chamber of Commerce, Reno Rotary
Club, and Greater Carson Club;
L. V. CAMPBELL, for Nevada State Department of Highways.

HEARING AUGUST 16, 17, 1920—DECIDED SEPTEMBER 17, 1920

OPINION

By the Commission:

Pursuant to applications filed with this Commission May 24 and July 17, by the carriers serving Nevada for the same percentage of increase in rates to cover state business as those to be ordered for interstate business by the Interstate Commerce Commission, the matter came on for public hearing before this Commission at its office in Carson City on August 16 and 17, 1920.

THE ISSUES

The carriers' contentions in this proceeding relate exclusively to railroad values and revenues, and are based on the opinion and order of the Interstate Commerce Commission—proceeding under the Esch-Cummins law, comprising the Transportation Act and the Interstate Commerce Act, as amended—in Docket Ex Parte 74, heard at Washington, D. C., May 24–July 6, inclusive, and decided July 29, 1920, wherein the Commission fixed groups and territories and authorized the carriers to horizontally apply to interstate business a 25% increase in freight rates; a 20% increase in milk rates; a 20% increase in passenger fares; and a 50% increase in Pullman fares. Without regard to the reasonableness of rates to the public, this Commission is requested to authorize the carriers to make the same percentage increase in rates and fares effective on state business within Nevada.

The carriers put in evidence certified copies of the Interstate Commerce Commission's decision and order in Ex Parte 74, I.C.C. Rate Order No. 149 and Special Permission Order No. 50340, relating to the aforesaid increased rates for interstate traffic. They alleged that the aforesaid Federal Act prohibits and makes unlawful discrimination of every character including discrimination against interstate commerce, and that, to avoid such discrimination, and likewise to carry out the purposes of the Act with respect to an adequate net

operating income, it is necessary that uniform advances be made on state and interstate traffic. That the Act provides for cooperation between State and Federal Commissions for the purpose of bringing state and interstate rates into harmony; that, in so far as consistent with the authority of this Commission, the case be considered as heard upon a common record by the Interstate Commerce Commission and this Commission; that the aforesaid horizontal increase in freight rates and passenger and Pullman fares be made effective not later than September 1, 1920, and that the rules covering the publication of tariffs be so amended or suspended as to effectuate said purpose.

In response to citation and order of this Commission the carriers furnished earnings-and-traffic data called for, but refused to furnish the fair and reasonable value of their properties actually used and beneficially devoted in rendering service to the people of Nevada—on the ground that they had reported their book-cost investments to the Interstate Commerce Commission in Ex Parte 74, and that they were unable to segregate and assign from the group valuation fixed by the Interstate Commerce Commission that portion of the property which is within and properly creditable to Nevada. They also refused to formally introduce the record of the testimony taken before the Interstate Commerce Commission in Ex Parte 74, on the ground that the decision of the Commission in said case was sufficient for all purposes; that other than the offer of this decision they would not introduce any further testimony or participate in the cross-examination of witnesses, desiring to be heard upon the effect which the proposed increases in state and interstate rates would have upon their respective lines of business and upon the welfare and development of the State for the future.

That in accordance with the provisions of paragraph 3 of section 13 of the Interstate Commerce Act and at the invitation of the Federal Commission it was alleged that this Commission became a party to and cooperated with the Interstate Commerce Commission in the hearing and consideration of the testimony in Ex Parte 74, being represented by a committee of three members of the National Association of State Railway Commissioners—said committee having recommended that the carriers as a whole throughout the United States were entitled to an increase in interstate rates in order to meet present abnormal conditions; that the Nevada intrastate rate structure, at least in so far as its relation to the Federal rate structure is concerned, was before the Interstate Commerce Commission in Ex Parte 74, and that the findings and order, made under the congressional mandate to provide a return of 6 per cent on the aggregate value of the carriers' property in rate groups and territories, not only affected the intrastate struc-

ture but assumed a concert of action on the part of the various state authorities charged with the regulation of intrastate commerce to effectuate the revenue intent of the Transportation Act; that the Interstate Commerce Commission took special cognizance of the peculiar situation existing in Nevada and other States in the western portion of the United States by creating the Mountain-Pacific group, which is referred to in its decision in Ex Parte 74 as follows:

The record shows that the principal railroads serving the territory west of the Colorado common points, especially the so-called transcontinental railroads, as a whole, are in substantially better condition than other carriers in the western territory. It also shows that the rates, generally speaking, are materially higher in the region west of the Colorado common points than in the part of the western territory lying east thereof. Considering the whole situation, it is our view that the territory west of the Colorado common points and the traffic to and from that territory may properly be given separate treatment.

The new Mountain-Pacific rate group, including Nevada, comprises all that territory lying west of the western boundary lines of the States of North Dakota, South Dakota, and Nebraska to the line of the Union Pacific extending east from Cheyenne, Wyoming, thence southward from Cheyenne through Denver and Trinidad, Colorado, then following the line of the Atchison, Topeka and Santa Fe Railroad through Raton and Las Vegas and Albuquerque, New Mexico, to El Paso, Texas; that as a result of this segregation the carriers operating in the Mountain-Pacific group were granted by the Interstate Commerce Commission an increase of but 25%, instead of 32.03% as requested, compared with which the carriers operating in Western, Official, and Southern territories were granted freight-rate increases of 35%, 40%, and 25%, respectively; that if this Commission fails to authorize the horizontal rates in question, and, if its regulation of, or its failure to regulate, state rates produces such a discrimination as to amount to a burden upon interstate rates, the jurisdiction of the Interstate Commerce Commission, under section 13, paragraph 4, of the Commerce Act, would be invoked to remove same, and by this action federal regulation would be substituted for state regulation and thus destroy state control over its own commerce for the future.

That—although it was conceded that in Nevada, as well as other States, the application of the aforesaid inflexible horizontal increases in rates would necessarily cause a drying-up of some traffic as to which it was not expected that any such condition should result under the Interstate Commerce Act either as to interstate or intrastate traffic—it was the position of the carriers that in such cases the matter should be taken up by the injured shippers with the carriers for adjustment

as directed by the order of the Interstate Commerce Commission; that, under the Commerce Act as amended, the case, in so far as the carriers are concerned, is concluded by the decision of the Interstate Commerce Commission in Docket Ex Parte 74, decided July 29, 1920; that the case is a revenue measure and not an ordinary rate case; that this Commission should consider the issue presented from a revenue standpoint rather than the old basis of ascertaining what is the value of the property devoted to the state service and then fixing rates that would produce a fair return upon the property actually and beneficially devoted to the service; and that no modification of this inflexible rule may be made by state authority, even though the new rates may be confiscatory of state business, and, therefore, the only question is whether this Commission in the present proceeding will, or will not, enter an order in conformity with the decision of the Interstate Commerce Commission providing for the aforesaid horizontal rate increases.

PROVISIONS OF THE LAW UPON WHICH THE CARRIERS RELY

The provisions of the Transportation and Interstate Commerce Acts, and the decision of the Interstate Commerce Commission in Ex Parte 74, upon which the carriers rely, are as follows:

On page 256 of the decision of the Interstate Commerce Commission in Ex Parte 74 the following ruling is made:

It is expected that shippers will take these matters up [referring to readjustment of rates] in the first instance (with the carriers, and the latter will be expected to deal promptly and effectively therewith, to the end that necessary adjustments may be made in as many instances as practicable without appeal to us.

Section 209 of the Transportation Act provides that carriers may, if they desire, accept and continue to enjoy the war-control guaranteed compensation for the six months period of private operation from March 1 to September 1, 1920; whereas section 208 of the same Act provides that the 25% increase in war-control rates, established by the Railroad Administration's Order No. 28, June 25, 1918, shall continue in effect until September 1, 1920, unless changed by state or federal authority or pursuant to authority of law—provided, however, that no reduction in rates shall be made unless approved by the Interstate Commerce Commission.

Section 210 of the Transportation Act appropriates \$300,000,000 for the purpose of loans to the carriers to assist them through the transition from federal to private control and operation, while section 202 of the same Act appropriates \$200,000,000 for the purpose of taking care of matters arising during federal control; and to the

same end there is made available all unexpended balances in the Railroad Administration revolving fund, provided for during federal control by Acts of March 21, 1918, and June 30, 1919—aggregating more than one billion dollars.

Paragraphs 3 and 4 of section 13 of the Interstate Commerce Act authorize the carriers to file an action against state and federal rates, rules, or regulations that may unreasonably burden commerce, and the Interstate Commerce Commission is authorized to hold joint hearings with the state commissions; to avail itself of the service, records, and facilities of such state authorities, and, after full hearing, to remove unjust and unlawful discrimination arising from a conflict of interstate and state rates—one with the other—the laws of any State or the orders of any state authority to the contrary notwithstanding.

Paragraph 2 of section 15a of the Interstate Commerce Act empowers the Commission to initiate, modify, establish, or adjust such rates for the carriers as a whole, or by groups or territories, as will, under honest, efficient, and economical management, earn a fair return upon the aggregate value of the property held for and used in the public service; in connection with which paragraph 3 provides for the enlargement of present transportation facilities, including the specific provision that for the ensuing two years from September 1, 1920, the percentage of return on carriers' property shall not be less than 5½ per cent, plus an allowance of one-half of one per cent on said aggregate value to be applied to improvements and betterments.

Paragraphs 5 and 6 of section 15a of the Commerce Act provide that when carriers earn a return on the value of their property, held for and used in the public service, in excess of 6% per annum, beginning September 1, 1920, one-half of such excess shall be paid to the Government for the purpose of establishing a reserve fund, out of which loans to carriers may be made to meet expenditures for capital account and for purchase of equipment and facilities by the Government and the leasing of same to the carriers. The one-half earning excess over 6% retained by the carriers shall be held as a trust fund to the extent of and until it reaches 5% of their aggregate property value, to be determined by the Interstate Commerce Commission, for the payment of rent of leased roads, and for interest and dividends during lean years. Accumulations over the aforesaid 5% trust fund may be disbursed for any lawful purpose—such, for example, as the payment of extra dividends, and thereafter the reinvestment of such amounts by the stockholders as capital account expenditures for additions and betterments to property.

This section is of doubtful constitutionality. Earnings of public utilities, made under rates lawfully published with state and federal

regulating authorities, and against which there were no complaints or protests, are the property of the company earning them. If the section can be enforced, it will operate either to retard the exercise of the highest managerial ability to make earnings in excess of the guaranteed 6% return, or to encourage excessive investments in enlarged equipment and facilities (over which there is yet no control) in order to absorb what would otherwise be an excess earning over the aforesaid 6% return.

SUMMARIZATION OF CARRIERS' CONTENTIONS

The carriers' construction of the Interstate Commerce Act as amended, and the decision thereon in Ex Parte 74, is to the effect that they have been made a special and preferred class—in every way superior to the jurisdiction of the States under which they were created, because the Interstate Commerce Commission has prescribed defined rate groups and determined the aggregate value of railroad property by such subdivisions instead of by States, including authority to exact horizontal 6% return rates for the ensuing two years, and that, therefore, proceeding under the aforesaid delegation of power from the Federal Commission in Ex Parte 74, they may ignore state authority and make such regulation of state commerce and permit only such continuation and development of state industries and resources for the future as will not interfere with their determined group property value and the 6% return thereon. In other words, that the carriers have (if the above power be conceded) been clothed with authority to regulate state government and the rights of the people thereunder; that, by the alleged enactment into law of the "Shreveport principle," providing that commerce may not be unreasonably burdened by state and federal rates (sec. 13, par. 4, I. C. Act), the Interstate Commerce Commission has been given the full equivalent of jurisdiction over the regulation of state commerce whenever the State fails, or refuses, so to regulate its commerce as to harmonize with the Federal Commission's regulation of interstate commerce, and this without regard to the reasonableness of such regulation or to its effect upon the development of the State or States affected.

DANGER OF CENTRALIZATION

If this character of regulation of commerce by regional instead of state subdivisions should ever become effective, there would, of course, at once be substituted for sovereign state power and jurisdiction railway regional provinces, following which the managers of railway, industrial, and financial interests would be endowed with greater power than can be exercised by the States. That this is the long-cherished desire of the railroads, admits of no argument, for the rea-

son that they have been working since the inception of the Shreveport case in 1912 to free themselves from the effective regulatory jurisdiction of the States (the 48 masters, so-called) in order to make good excessive investments, to still further increase them without control, and to assess and exact higher returns from the people.

Obviously, the carriers' pleadings in this proceeding put squarely in issue the question as to whether or not they have been made superior to, and free from, state jurisdiction. Much has been said in the past about the desirability of the exercise of concurrent jurisdiction by the Federal and State Commissions in the regulation of railroads (and this is provided for as aforesaid), but by the formal pleadings of the carriers, and their construction of the law in this case, nothing less than the full relinquishment of state control is demanded for the future. It is, therefore, necessary that every step of the way be watched and safeguarded, for the reason that, if the carriers' construction of the law in this case receives the sanction of the United States Supreme Court, the rights of the States and the liberties of the people will indeed have been seriously invaded; also the precedent will have been established upon which all lines of big business may lobby through Congress a form of federal control and thereby destroy the most important rights and powers of the States for the future. In fact, the rapidly drifting tendency toward exclusive federal regulation and administration of railroads, highway construction, irrigation, forest range reserves, prohibition enforcement, and other governmental activities has already reached the danger line. The inauguration of this policy is defended upon the ground that it relieves the State of certain burdens of administration, but, in the end, these federal costs come back and are paid by the people of the respective States in one form or another. Incidentally, it may not be too strongly emphasized that, for every administrative officer that centralized federal control may save the State, at least one, and often more, federal employees are substituted; from which it follows that, unless the people effectively guard their reserved powers and insist upon their administration through the medium of their state officers, they will be taken from them and centralized at Washington for the future.

More and better attention to government is demanded of every good citizen than has been the rule during the recent past if his rights and liberties are to be preserved, and in this connection more effective support and encouragement must be accorded to our Senators and Representatives in Congress in order to secure the best results. Under the present indifferent attitude of the people (except at periodical election times) the average member of Congress is the most lonesome and neglected officer that serves the people of the respective States. Is

it therefore any wonder that encroachments on state governments grow when the people elect their congressional representatives, forthwith forget them, and turn their undivided attention to state remedial legislation—which is closer to them—entirely without regard to the legislation which is being promoted by special interests for the very purpose of centralizing practically all activities of government at Washington for the future? In regard to the federal commerce legislation here under consideration, it should be noted with honor and credit to the people of Nevada that Senators Pittman and Henderson and Congressman Evans voted against the passage of the Esch-Cummins bill on the ground that it did not properly protect the rights of the people of Nevada and that it was highly preferential to the railroads and prejudicial to the Government.

THE SHREVEPORT PRINCIPLE

The "Shreveport principle" referred to herein arises from the action of the Texas Railroad Commission in fixing within its State rates lower than those maintained in the State of Louisiana by the railroads, in order to offset the effect of the lower long-and-short-haul rates from Kansas City, St. Louis, and eastern points to Shreveport, Louisiana, than those maintained by the carriers to Dallas, Fort Worth, and other Texas cities. For example, the rate on printing paper from Kansas City to Dallas for a 517-mile haul was \$12 per ton, whereas for a haul of more than 700 miles from Kansas City through Dallas to Shreveport, the rate was but \$8 per ton. On complaint from Shreveport merchants, the Interstate Commerce Commission ordered the railroads to remove the discrimination complained of in the Texas rates, without regard to the above-described discrimination covering the inbound Red River potential water competitive rates to Shreveport, and which the railroads complied with by increasing the aforesaid Texas local rates to the level of the Louisiana rates. Again, it arose upon the complaint of the St. Louis Chamber of Commerce that the Interstate Commerce Commission had increased interstate fares from 2 cents to 2.4 cents per passenger per mile and that the statutory Illinois fare of 2 cents per mile afforded passengers traveling from Chicago to East St. Louis, Illinois, a 2-cent fare, while those destined to St. Louis, Missouri, were required to pay a fare of 2.4 cents per mile. The Interstate Commerce Commission ordered the carriers to remove this discrimination, which they attempted to do by increasing every 2-cent fare throughout the State of Illinois to 2.4 cents per mile, but this action was outside the issue raised by the complaint, and, therefore, the United States Supreme Court held the action of the carriers invalid. In the Shreveport Case, 234 U. S. 342, and in the Illinois passenger fare case, 245 U. S. 136, the Court held:

In correcting such discrimination Congress is not restricted to an adjustment or reduction of the interstate rates, but may prescribe a reasonable standard to which they shall conform, and require the carrier to adjust the intrastate rates in such way as to remove the discrimination; for, where the interstate and intrastate transactions of carriers are so related that the effective regulation of one involves control of the other, it is Congress, and not the State, that is entitled to prescribe the dominant rule.

Where a proceeding to remove unjust discrimination presents solely the question whether the carrier has improperly exercised its authority to initiate rates, the Commission may legally order, in general terms, the removal of the discrimination shown, leaving upon the carrier the burden of determining also the points to and from which rates must be changed, in order to effect a removal of the discrimination. But where, as here, there is a conflict between the federal and state authorities, the Commission's order cannot serve as a justification for disregarding a regulation or order issued under state authority, unless, and except so far as, it is definite as to the territory or point to which it applies, for the power of the Commission is dominant only to the extent that the exercise is found by it to be necessary to remove the existing discrimination against interstate traffic.

PRESENT LONG-ESTABLISHED RATE BASES

It is of the highest importance that power for the reasonable exercise of judgment be retained within the various commonwealths in order to adequately and satisfactorily meet the local interests within each. It does not follow, therefore, that local rates must of necessity be uniform or the same for traffic in one or more States and without regard to the imaginary lines separating them. This is true because our natural resources vary so greatly in the different geographical subdivisions or States that railway traffic managers and regulating tribunals do not find it necessary or justifiable to establish the same local rate for several different States. On the contrary, they fix the local rates on the basis of the peculiar circumstances and conditions found within the confines of the various States, and, when the reasonableness and the compensatory character of such rates are measured by the commissions and the courts, they are based largely upon the conditions existing within the particular State, the value of the property necessarily and beneficially used within the regulating State, the operating conditions of the road therein, the energy, the creative and the productive ability of the people, the necessities incident to industrial and state development, and the density of traffic and other conditions within the State affecting intrastate earnings and operating expenses.

As to the regulation of interstate traffic, however, provision may

fairly and beneficially be made for zone or blanket rates covering large areas or territories in order to widen the purchasing and selling markets as much as possible. The rates fixed by the State for its domestic business are usually, for the reasons above given, either equal to or higher than interstate rates—in most cases much higher proportionately than the interstate rates—and, therefore, the interstate rates need not interfere with or affect said state rates. Nor, on the other hand, need said state rates unreasonably affect interstate rates. There can, with proper facility, be two schedules of rates maintained—one covering the movement of state traffic and another covering the movement of interstate traffic—and this, in fact, is the manner in which the railroads have maintained and do now maintain their rate schedules covering these two classes of commerce.

In this connection, the United States Supreme Court has said over and over again that state regulation of intrastate rates is not an interference with the regulation of interstate rates; that, ordinarily, the two are separable from a rate-making standpoint, and that it is only where the regulations by the State of its domestic rates so directly affect interstate rates as to amount to an unreasonable burden on interstate commerce that there is any ground whatever which authorizes Congress or its subordinate tribunals to interfere, and in such event the burden must be clearly undue; in other words, something more than the incidental effect which arises in the proper discharge of the State's power to control and regulate its own internal commerce.

**WITHOUT CONSENT OF STATE, FEDERAL AUTHORITIES MAY
NOT INVADE RESERVED POWERS OF NEVADA**

Without the consent of the State, federal authorities may not constitutionally regulate Nevada's internal commerce—the adoption of territorial valuation and rate regulation to the contrary notwithstanding. Interstate convenience in matters of administration will not offset state necessity in the maintenance of its sovereign rights and the protection of its people from unjust and unreasonable local rates. Under its delegation of power from Congress, the Interstate Commerce Commission's valuation and rate groups may be made by States as well as by territories, and, therefore, there is no justification for the creation of superstates, or regions, where such action unconstitutionally or injuriously affects the rights of the State and its people.

The territorial horizontal increases in rates prescribed by the Commission for interstate traffic has, as will hereinafter appear, cast an unreasonable and confiscatory burden on interstate traffic originating within this State, and to authorize the same percentage increases on traffic within the State would operate excessively and discriminatorily on many lines of traffic, for which we find no warrant in the laws

of this State. Further, section 13, par. 4, Interstate Commerce Act, is reciprocal in its action and prevents the imposition of unreasonable discrimination or undue burdens being cast upon state commerce by the regulation of interstate rates, as well as burdens upon interstate commerce flowing from the regulation of, or the failure to regulate, state rates. There is nothing in the Act which authorizes the Federal Commission to fix a high rate in one State in order that it may confer jurisdiction upon itself to say that rates in another State are too low and must, therefore, be raised to the same level without regard to any other consideration—as has been so strongly urged upon this Commission by the carriers in this case.

**CONGRESS HAS NOT ATTEMPTED INVASION OF RESERVED
POWERS OF STATES**

The Interstate Commerce Act as amended, and decision of the Commission thereon in Ex Parte 74, does not invade the reserved powers of the States. Paragraph 2 of section 1 of the Act specifically provides as follows:

The provisions of this Act shall not apply to the transportation of passengers or property, or to the receiving, delivering, storing, or handling of property, or to the transmission of intelligence by wire or wireless wholly within one State and not shipped or transmitted to or from a foreign country from or to any place in the United States as aforesaid.

Subdivision 17 states that:

Nothing in this Act shall impair or affect the right of a State in the exercise of its police power to require just and reasonable freight and passenger service for intrastate business except in so far as such requirement is inconsistent with any lawful order of the Commission, made under the provisions of this Act.

Paragraph 2, section 1, contains the same reservation which has been carried by Congress in the "Act to Regulate Commerce" ever since its enactment in 1887, and, therefore, the construction to be placed upon it at the present time cannot be better stated than by setting forth the interpretation of this provision by the United States Supreme Court in the Minnesota Rate Case, 230 U. S. 422, decided June 9, 1913, wherein it said:

Having regard to the terms of the federal statute, the familiar range of state action at the time it was enacted, the continued exercise of state authority in the same manner and to the same extent after its enactment, and the decisions of this court, recognizing and upholding this authority, we find no foundation for the proposition that the Act to regulate commerce contemplated interference therewith.

Congress did not undertake to say that the intrastate rates of interstate carriers should be reasonable or to invest

its administrative agency with authority to determine their reasonableness. Neither by the original Act nor by its amendment did Congress seek to establish a unified control over interstate and intrastate rates; it did not set up a standard for intrastate rates, or prescribe, or authorize the Commission to prescribe, either maximum or minimum rates for intrastate traffic. It cannot be supposed that Congress sought to accomplish by indirection that which it expressly disclaimed, or attempted to override the accustomed authority of the States without the provision of a substitute. On the contrary, the fixing of reasonable rates for intrastate transportation was left where it had been found; that is, with the States and the agencies created by the States to deal with that subject. (*Missouri Pacific Ry. Co. v. Larabee Mills*, 211 U. S. 612, 620, 621.)

**NEVADA COMMISSION LAWFULLY CREATED AND NOT AUTHORIZED
TO RELINQUISH ITS JURISDICTION**

The Nevada Public Service Commission Law, approved March 28, 1919, provides that railway service shall be adequate, and every unjust and unreasonable charge for service is prohibited and declared to be unlawful (sec. 9); that the Commission has full power to ascertain the value of railroad property actually used and useful in the public service; to fix just and reasonable rates and fares for intrastate freight, passenger, express and sleeping-car service within the State (secs. 8, 17, and 27); to prevent rebating and unreasonable preferences and discriminations; to authorize nondiscriminatory special or contract rates, rules, and regulations; to prescribe classifications of service and fix and regulate rates therefor; to suspend schedules of increased rates and fares for a period of sixty days pending hearing and investigation as to reasonableness; and to order improvements and the installation of safety devices for the safety of the traveling public and railway employees.

In addition to the foregoing there is a complete remedy at law provided by section 33 for the protection of the railroads against any unreasonable order of the Commission which might amount to an abuse of power, or an unlawful invasion of property rights.

STATE RIGHTS AND THE COMMERCE CLAUSE

In support of the doctrine of States' rights, or, better stated, in support of and in protection of our dual form of government, we set forth below the commerce clause and reference to leading authorities from the United States Supreme Court dealing with the reserved powers of the States and the people. The commerce clause of the Constitution of the United States (art. 1, sec. 8) reads as follows:

Congress shall have power to regulate commerce with foreign nations, among the several States, and with the Indian tribes.

For construction covering commerce clause by United States Supreme Court, see:

Gibbons v. Ogden, 9 Wheat.
Munn v. Illinois, 94 U. S. 124.
The Daniel Ball, 10 Wall. 557.
Sands & Manistee River Imp. Co., 123 U. S. 288.
Smyth v. Ames, 169 U. S.
Regan v. Mercantile Trust Co., 154 U. S. 413.
Houston R. R. Co. v. Mays, 201 U. S. 321.
Mo. Pac. R. R. Co. v. Larabee Mills Co., 211 U. S. 612.
Bridge Co. v. Kentucky, 154 U. S. 204.
United States v. DeWitt, 9 Hale, 41.
Weller v. United States, 213 U. S. 138.
Hammer v. Dagenhart, 240 U. S. 274.
Minnesota Rate Cases, 230 U. S. 352.
Western Union Telegraph Co. v. Kansas, 216 U. S. 1.
Nazie v. Moore, 14 How. 574.
McColloch v. Maryland, 4 Wheat. 403.
Cohens v. Virginia, 6 Wheat. 389.
Lane County v. Oregon, 7 Wall. 76.
Texas v. White, 7 Wall. 725.
Green v. Frazier, 40 Supreme Court Reporter, 499.
Cooley's Constitutional Limitations.
President Madison, 3 Farrand, Records of Federal Constitution.

Among the framers of the Constitution, the proponents of the federal plan construed the "commerce clause" and explained that it empowered the Federal Government to control interstate commerce only, and that the States and the people were left free to exercise all rights and powers which had not been specifically delegated. (The Federalist, 32-82.)

In construing the commerce clause, Madison said (3 Farrand, Records of Federal Constitution):

It was intended as a negative and preventive provision against injustice by the States themselves, rather than as a power to be used for the positive purposes of the General Government.

Incidentally the negative referred to, viz, "the positive purposes of the General Government," and the invasion of the prerogatives of the States, is raised for the serious consideration of the people of the future.

In exemplification of what is said hereinbefore, and for the purpose of concisely defining our dual form of government, the importance of the inherent powers of the State and the reserved rights of the people, there is set forth below an extract from the case of *Gibbons v. Ogden*, 9 Wheat. 1, wherein the learned Chief Justice Marshall, in construing the commerce clause, said:

The subject to be regulated is "commerce," and our Constitution being, as was aptly said at the bar, one of enumeration

and not of definition, to ascertain the extent of the power it becomes necessary to settle the meaning of the word. The counsel for the appellee would limit it to traffic, to buying and selling, or the interchange of commodities, and do not admit that it comprehends navigation. This would restrict a general term, applicable to many subjects, to one of its significations. Commerce, undoubtedly, is traffic, but it is something more—it is intercourse.

It has been truly said that commerce, as the word is used in the Constitution, is a unit, every part of which is indicated by the term. If this be the admitted meaning of the word, in its application to foreign nations it must carry the same meaning throughout the sentence, and remain a unit, unless there be some plain, intelligible cause which alters it.

The subject to which the power is next applied is commerce “among the several States.” The word “among” means intermingled with. A thing which is among others is intermingled with them. Commerce among the States cannot stop at the external boundary line of each State, but may be introduced into the interior.

It is not intended to say that these words comprehend that commerce, which is completely internal, which is carried on between man and man in a State, or between different parts of the same State, and which does not extend to or affect other States. Such a power would be inconvenient and is certainly unnecessary. Comprehensive as the word “among” is, it may very properly be restricted to that commerce which concerns more States than one. The phrase is not one which would probably have been selected to indicate the completely interior traffic of a State, because it is not an apt phrase for that purpose; and the enumeration of the particular class of commerce to which the power was to be extended would not have been made had the intention been to extend the power to every description. The enumeration presupposes something not enumerated; and that something, if we regard the language of the subject of the sentence, must be the exclusively internal commerce of a State. The genius and character of the whole Government seems to be that its action is to be applied to all the external concerns of the Nation, and to those internal concerns which affect the States generally; but not to those which are completely within a particular State, which do not affect other States, and with which it is not necessary to interfere, for the purpose of executing some of the general powers of the Government. The completely internal commerce of a State, then, may be considered as reserved to the State itself.

The sovereignty of a State extends to all persons and things within its confines, and is the supreme, absolute, and uncontrollable power and right to govern. Under this sovereignty States have full power to regulate within their limits matters of internal policy, including in that general designation whatever will promote the peace, comfort, convenience,

and prosperity of their people. This power embraces the construction of roads, canals, and bridges and the establishment of ferries, and it can generally be exercised more wisely by the State than by a distant authority. (*Gilman v. Philadelphia*, 3 Wall. 713.)

In *Hammer v. Dagenhart*, 247 U. S. 251, the United States Supreme Court, in construing the commerce clause, said:

The purposes intended must be attained consistently within constitutional limitations and not by invasion of the powers of the States. This Court has no more important function than that which devolves upon it the obligation to preserve inviolate the constitutional limitations upon the exercise of authority, federal and state, to the end that each may continue to discharge, harmoniously with the other, the duties entrusted to it by the Constitution. * * * The grant of authority over a purely federal matter was not intended to destroy the local power always existing and carefully reserved to the States in the Tenth Amendment to the Constitution. In interpreting the Constitution it must never be forgotten that the Nation is made up of States, to which are entrusted the powers of the local government and to them and to the people the powers not expressly delegated to the National Government are reserved. (*Lane County v. Oregon*, 7 Wall. 71.) The power of the States to regulate their purely internal affairs by such laws as seem wise to the local authority is inherent and has never been surrendered to the General Government.

In the judgment which established the broad power of Congress over interstate commerce, Chief Justice Marshall said (9 Wheat. 203): * * * [It was not intended to] "form a portion of that immense mass of legislation which is embraced within the territory of a State, not surrendered to the General Government, all of which can be most advantageously exercised by the States themselves."

The manifest intention of the people to reserve and exercise the inherent right and power of state government for their protection, safety, and comfort is made clear by the Tenth Amendment to the Constitution of the United States, which reads as follows:

The powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people.

WAR COST OF RAILROAD ADMINISTRATION AND LAND-GRANT RATE EARNING DEFICIENCIES A TAX AGAINST ALL PROPERTY

The cost of railroad operation to the Government during the 26-month period of federal control is estimated to be fifteen million dollars for Railroad Administration expenses; seventy-five million dollars to cover increased cost of working supplies and materials restored with the lines when turned back to private operation on March 1, 1920:

two hundred million dollars to cover claims for deferred maintenance during federal control, and seven hundred and fifty million dollars to cover deficiencies in guaranteed earnings to March 1, 1920.

This is a war cost, and when analyzed may not fairly be termed a loss, because the carriers, under government land-grant charter provisions and equalization contracts covering the greater portion of the railway mileage west of the Mississippi River, and a substantial mileage throughout the Southern States, were required to move war munitions, materials, supplies, and troops at free and half rates. If this traffic had been moved at full tariff rates, or the same as charged to the various States and to the public, it may be asserted that all of the aforesaid deficiency of seven hundred and fifty million dollars in government railway operations would have been offset. This is thought to be especially true with respect to the western lines, where free and half-rate allowances were made covering the movement of government freight and troops, which, if credited with full tariff rates, would doubtless have shown such profits as to have precluded any reasonable basis upon which they could have been heard to demand higher rates, if, in fact, they could have justified the continued maintenance of the 25% war increase made in 1918.

The effect of these land-grant preferential rates upon total earnings is obvious when it is considered that the 750-mile portion of the Southern Pacific Company between Portland and San Francisco is a free-rate line; that the Santa Fe from Albuquerque, New Mexico, to San Francisco is a half-rate line; that the Union Pacific-Central Pacific railroad from Omaha to San Francisco is a half-rate line; and that the Northern Pacific Railroad, the Great Northern Railroad, and the Chicago, Milwaukee and St. Paul Railroad are also half-rate lines. It may also be noted, in passing, that purchases of hay, grain, lumber, and other products of the soil and forests are frequently made in Oregon, but never in Nevada, by the Army posts on San Francisco Bay because of the aforesaid free-rate consideration.

The government land-grant donations to the railroads, including those by the State of Texas, will approximate 187,000,000 acres when all adjustments have been made; that these land grants are not gifts or donations in the ordinary sense is made clear by the debates in Congress back in the 50's of the past century, from which it appears that private capitalists would not risk the venture of constructing and extending lines of railroad from the Mississippi River to the Pacific Coast, which were badly needed for military and colonization development purposes; that the grants would secure the construction of these indispensable agencies, while at the same time the land would become taxable for the support of the States instead of lying dormant in the public domain, and, by the enhanced value its development

would bring to each alternate section that was retained along these routes, the Government would be fully reimbursed for the grants.

Before title to these lands passed from the Government, the railroad had first to be constructed and in addition incurred obligation in perpetuity for the transportation of government property, war munitions, and troops at free or reduced rates. In *Burke v. Southern Pacific Railroad Company* (234 U. S. 669) wherein the question of railroad grant lands was under consideration, the court held that the railroad had "earned its right to the lands described."

In consideration of a fair equalization of the burden of railroad-rate taxation upon the people, the World War has proven that in periods of such emergency it is manifestly unjust for the Government to longer participate in free concessions covering the movement of its enormous volume of Army and Navy freight-and-passenger business.

The government railroad transportation bill for war purposes from May 1, 1917, to March 1, 1920, will approximate one billion dollars. To whatever extent the aforesaid concessions have reduced the true railroad earnings when measured and taken at full tariff rates, it has, of course, been an important factor in the more than 50% increases in railway charges which have been authorized by the federal authorities since June 25, 1918.

As a war facility our railroads are equally as indispensable as the Army and Navy, and therefore unusual expenditures incurred by the railroads when the Nation is in peril should be treated the same as those of the Army and Navy and by taxation be equally spread over all classes of property, such as the arts and treasures, moneys and credits, and all fixed forms of property that do not contribute to the support of the railroads, and which are not affected by railroad rate increases, instead of casting the burden upon the shipping and traveling public as has been done since June, 1918. It is, therefore, clear that these free and half-rate concessions to the Government should be relinquished and full tariff rates paid upon war traffic in order that all classes of property may bear their just share of the war burden, while at the same time relieving those shippers and travelers least able to pay an excessive and unjust rate exaction for the service rendered.

SENATORS CUMMINS AND TOWNSEND IN RE ABNORMAL, UNUSUAL, AND EXTRAORDINARY WAR USE OF RAILROADS

In discussing this very point, as to a proper disposition of the railway war burdens, on the floor of the Senate on March 13, 1918, when the conference report of the Railway Control and Compensation Act, as amended, was upon final consideration, Senator Cummins, a member of the conference committee, said, in explanation of his vote against the report:

Can you defend any such course as that? Will any Senator here be heard to say that, if this war requires the railroads to be used in a particular way—in an abnormal, unusual, extraordinary way—in order to carry on the war, the men and women who are dependent upon transportation in carrying forward the ordinary affairs of life shall bear the burden? You know as well as I that a burden of that kind ought to be borne through general taxation, and not through railway rates.

And to the same effect and upon the same occasion, Senator Townsend, another member of the conference committee, said, in explanation of his vote against the report:

I do not care to discuss the merits of the question as to whether rates should be high or low, or whether they should be increased or decreased; my statement * * * is that the power to increase rates is not essential to the conduct of the war, so far as the railroads are concerned. The question of raising rates is to be brought about after the general increase of the wages of railroad men throughout the United States has occurred, and that condition will be carried over into times of peace, when the war is over. It is this fact which pleases the railroad owners.

We had great contention over this subject. Finally, the department desired that we should incorporate in the bill the provision whereby the Interstate Commerce Commission could fix the rates, but they are obliged to fix those rates so high as to compensate for all the circumstances of federal operation of the roads. I contended against that proposition, believing it to be absolutely wrong.

The railroads were taken over as a war necessity; there was no other excuse for taking them over. Those railroads were to be operated not in accordance with the principles of economy but in accordance with the principles of efficiency for the war. Provision was made for constructing tracks, if the President so desired, to munition factories or other interests operated by the Government and to shipyards.

To have Congress provide that the Interstate Commerce Commission must fix the rates of traffic so high as to meet all of these extraordinary circumstances was to put in force a law which was unjust in the extreme. The farmer whose products are transported by rail to market; the merchant who brings his merchandise by railroad; the consumers of fuel and clothes and groceries, should not be compelled to pay for the operation of railroads for war purposes. * * *

I know the argument was made and the question was asked: "What difference does it make whether we take this money out of the shippers direct or whether we go into the treasury and take out the balance?" It makes all the difference in the world. When we speak of shippers we are reminded frequently that many of the shippers have made large sums of money and that they can well afford to con-

tribute out of their earnings this extra rate; but that loses sight of the actual fact that the shipper does not pay the freight. In all cases, or, indeed, in a majority of cases, it is the producer and the consumer in this country who pay the freight.

Senator Townsend's statement is both illuminating and prophetic. It shows that Congress was originally disposed to take care of extraordinary railway expenditures by taxation, or in the same manner that it was taking care of other war-facility expenditures. Ultimately, however, Congress was induced to provide not only generous compensation to the stockholders for the war use of their properties, including provision for adequate maintenance to a standard comparable with prewar times, but also to grant the Railroad Administration the power to fix wages and to increase rates.

RAILROAD MEN IN CONTROL DURING WAR OPERATIONS

While the Government is charged with responsibility for the deficiencies in service and rate increases during the war, it cannot be too strongly emphasized that, with minor exceptions, railway executives and attorneys remained in charge of their respective properties, were freely consulted, and exercised an effective voice in the Government's administration of the railroads every step of the way, and, therefore, when they complain against the Government, the carriers criticize themselves and their organizations.

In this connection we call attention to the statement by Walker D. Hines, Director-General of Railroads, on June 10, 1919, wherein he stated:

I want you to remember this fact: When the Government took possession of the railroads, not a single railroad was put under the direction of a man who was not a railroad man. Almost without exception, every railroad was left under the control of the very same operating men who had controlled it under private operation and when the present government control ceases and the railroad shall be turned back to private management these same men will continue to control the railroad operations.

From the beginning of the war in April, 1917, the Government was wholly dependent upon the railway organization and its official personnel. In the absence of any other trained organization or practical means of meeting the war transportation situation, and in view of the vital necessity of the railroads as a war facility—equally as indispensable for the winning of the war as the Army or Navy—quite naturally Congress looked for and followed the advice of the railway executives and attorneys in the formulation of the railway-control legislation.

Under the pressure of the emergency, and a patriotic desire to do

everything possible to assist in winning the war, checks and safeguards that otherwise would have been provided were not insisted upon because the average member of Congress was, of course, reluctant to take a position in opposition to the railway war policy outlined as aforesaid, even though for the time being it was subversive of peacetime public rights, conveniences, and economies. Likewise, under the same impulses, state officers and the shipping and traveling public patriotically assumed a similar attitude. The trunk-line railways have, therefore, exercised a large voice in the regulation of transportation during the past three years; in fact, under the urgency of war they have been almost as free from public regulation as the Army and Navy.

As predicted by Senator Townsend, the "higher wages and rates have been brought about and carried over into times of peace," upon which, if the horizontal raises provided for in Ex Parte 74 are enforced, the railway gross earnings will have grown since 1916 from three and one-half billion dollars to six and three-fourths billion dollars annually, or almost double, while the increase in traffic amounts to only approximately 10%.

**EFFECT OF INTERSTATE COMMERCE COMMISSION ORDER IF
APPLIED TO ALL TRAFFIC**

The record in the proceeding shows that, based upon a test year ending October 31, 1919, the carriers' gross earnings were five and one-fourth billion dollars. It is contended that not less than one and one-half billion dollars more, or a total of six and three-fourths billion dollars annually, is necessary to meet wage-increase payments of over six hundred million dollars annually, recently ordered by the Railway Labor Board, to become effective retroactively May 1, 1920, and to produce a 6% return on approximately nineteen billion dollars—the carriers' aggregate property value, as determined by the Interstate Commerce Commission in Ex Parte 74. When it is considered that the earnings for the prewar year 1916 were three and one-half billion dollars, and that a six-and-three-fourths-billion-dollar assessment is now proposed to be levied for the movement of traffic which, in the aggregate, is only about 10% greater than that handled in 1916, some conception of the tax burden to be placed upon the people is available. For the two years and two months of government-war control and operation of the railroads, the guaranteed earning compensation to the stockholders was approximately nine hundred million dollars per annum, covering 230,000 miles of road out of a total of 260,000 miles, while the 30,000-mile balance, comprising the short-line railways, continued under private operation and did not secure the benefits of the war guarantee, which was accorded the trunk lines.

TEST-YEAR PERIOD NOT REPRESENTATIVE

That the test year ending October 31, 1919, used by the carriers in this proceeding, is not a representative period, is made clear by statement of Director-General Walker D. Hines of the Railroad Administration, in charge of the railways of the country during the period in question. He said:

During the first six months of 1919 operating results were so unfavorable as to cause many suggestions in favor of then making a substantial general increase in freight rates, but it was apparent that the results for those months were to a very large extent due to the abnormal slump in business. Hence, it was believed that the showing of inadequacy of the revenues was too fragmentary and unreliable to justify the serious consequences incident to an additional reconstruction of rates.

At the beginning of the year the relapse in industrial activity following the armistice had fully set in and for the first six months the slump in freight business was most pronounced. During February, 1919, the average daily surplus of freight cars was 451,026, the highest number on record. The demand for coal in the first six months was extraordinarily small, due to the large stocks on hand at the signing of the armistice and to the subsequent slowing-down of industry. The average daily car surplus of coal cars in February, 1919, was 181,775 and increased in March to 183,993 (daily) which was the largest number of surplus cars on record with one exception. The coal strike beginning in November, 1919, the first nation-wide strike of bituminous miners that had ever been experienced, was perhaps the most destructive episode in the history of the country, and it will probably never be possible to approximate the needless loss to which the country was subjected.

THE SO-CALLED OUTLAW STRIKE

The so-called outlaw strike of the railway yard enginemen and switchmen which occurred in April of this year caused the most serious congestion and car shortage this country has ever experienced. It should and could have been prevented by the Railway Executives Association, in order to protect the people of this country from ruinous losses in business and to prevent a continuation of the present abnormal cost of living. By the exercise of proper cooperative methods the strike could have been forestalled at its very inception. It is conceded that these yard employees had patriotically worked throughout the war period at hazardous and skilled employments at a rate of pay averaging about \$5 per day, while other employment was paying from \$6 to \$7 per day at every industrial plant located on the tracks of the yards in which they were employed. They had been long promised an equalization of their pay upward to a fair basis, and the lines were turned

back into private operation with such promise on the part of the federal authorities. But this the railroad executives refused to do, taking the position that the matter should await the action of the Railway Labor Board, which was not then, or for some time thereafter, created. The strike took place, and, notwithstanding that the public was led to believe that there was no strike worthy of the name, it is now conceded that the yardmen quietly resigned by the hundreds and accepted jobs across the tracks in the industrials at higher rates of pay, causing an unprecedented turnover from highly experienced to wholly untrained forces in every large terminal yard throughout the eastern industrial section. Had the entire situation been carefully planned, it could not have been more damaging in its effect upon the service and in losses to the public and the carriers, and equally important is the reduction that it caused in the amount of traffic and revenues which the carriers would otherwise have earned, which will, of course, be charged to the public as contingent expenses and included not only as a part of the guaranteed return (estimated at \$600,000,000) which the Government must pay from March 1 to September 1, 1920, but also it will be used as the measure in justification for the higher rates now under way.

A temporary agreed basis of compensation pending the decision of the Railway Labor Board would have retained these trained forces and branch of the railway plant, and thus have prevented the ruinous losses that have occurred and are yet flowing from the congestion at terminals and resultant nation-wide car shortages. As illustrative of the effect of this turnover in terminal-yard forces expressed in terms of transportation accomplishments (but without information as to the enormous nation-wide losses which have accrued) recent reports indicate that when the strike occurred in April, 1920, there was a congestion of approximately 90,000 cars under load, which, during the first two weeks of the strike, grew to the enormous total of 288,000 carloads. On July 30 it had again been reduced to about 90,000 cars. For the eight weeks ending July 24 the effect is shown by the fact that 6,842,735 carloads of commercial freight were handled, whereas, during the same period in 1918, 7,529,634 carloads were handled. There were coal shortages throughout the eastern industrial centers of the country during the summer months and the supply to the Northwest through the Great Lakes is perhaps 50% of normal at this time. Further, as a result of the congestion, Chicago steel mills have, during much of the summer, been reduced to a half-time working basis, and it is estimated by steel representatives that there were at the end of July approximately 1,500,000 tons of steel and iron shipments awaiting cars for movement from the various plants.

EQUIPMENT EXCESSIVE IN CAPACITY AND EXPENDITURE AND WASTEFUL IN OPERATION

Except as to coal, oil, and ore equipment, the reasonable, economical, all-the-year-round needs of traffic are better served by the use of cars not in excess of 30 tons capacity. The shipping public cannot advantageously and economically use and consume traffic in excess of 30-ton lots, when the average traffic and service to the country at large is considered, and therefore the public should not be burdened with the cost of moving the excessive dead weight of 40- and 50-ton cars. Shippers do not and cannot purchase goods in quantities in excess of from 20-to-30-ton lots, and producers are finding it increasingly costly to load large cars to capacity because of higher wages demanded by labor for the loading and unloading of these larger cars. The dead-weight waste is enormous. The average weight of cars, including engines, in trainloads is approximately 25 tons per car, while the average load-carrying capacity is approximately 42 tons; the average loaded movement is but 28 tons per car, based on the month of January, 1920, or 66 $\frac{2}{3}$ % of capacity. When the empty-car movement is considered, it will be found that the average loaded movement per car is approximately 17 $\frac{1}{2}$ tons or 41.69% of capacity, and when local merchandise or less-than-carload shipments are considered, the average will not exceed 7 $\frac{1}{2}$ tons per car, or a load factor of only 18%, while the dead-weight factor is 82%.

Further, in the carriers' efforts to obtain maximum train loading, the average movement speed is less than 10 miles per hour; the car movement is less than 25 miles per day, and the locomotive movement or use is only 63 miles per day. While the cars are held by the shippers 37% of the time and are in the hands of the railroads 63% of the time, they are moving only 11% of the time. Locomotives are in productive service only 40% of the time, while the remaining time is spent in terminal engine-houses.

The average passenger train of six modern steel cars, including locomotive, is also excessive in weight, comprising as it does a tonnage of 550 tons per train; the number of passengers carried averages about 65 per train, whereas the carrying capacity is not less than 150 passengers per train, from which it follows that the ratio of load to capacity is but 44%, while the train weight reaches the surprising total of 8 $\frac{1}{2}$ tons for each passenger transported.

Henry Ford, speaking in "Engineering and Contracting" (Chicago, August 21, 1918), states that passenger coaches and freight cars are behind the times and points out that designers of railway rolling stock have failed to utilize modern knowledge of light alloys and structural principles. Among other things, he said:

Four-fifths of the railroad's work is the hauling of the dead

weight of its own wastefully heavy engines and cars. This is why railroad presidents have such a hard time to figure out freight-and-passenger rates on the 20% of live load to cover the cost of hauling this enormous 80% of dead weight around.

Under past and present railroad financial policy there has been and is no control exercised over the rapid enlargement which has taken place in road and equipment during the past ten years—this function being one of managerial discretion exercised by the railway owners. It may, then, be inquired, whether or not more than the reasonably adequate needs of the producing and consuming public are considered in the adoption of standards, and in additions and betterments to the Nation's railway plant, because such action results in providing a lucrative market for timbers, ties, rails, bridges, locomotives, cars, fuel, and all other railway supplies and materials, and to what extent it is responsible for continuing rate increases.

These heavy capacity transportation facilities of course call for increasingly heavy standards of rails, ties, and bridges, and therefore, aside from the waste involved in investment, operation, and maintenance of the plant, these excess capacity facilities are largely responsible for the prefit very slow movement of traffic, and, in fact, the failure to move all the traffic offered, to the great disadvantage and loss of the shipping public. They are also responsible for the exceedingly weak financial and poor earning condition of the short-line railroads that have been and are being forced to dissipate their earnings by putting in heavier ties, bridges, and locomotives in order to handle this heavy interline car equipment, owned by the trunk lines and upon which they are dependent because in most cases they have no freight-car equipment of their own, and it is therefore reflected in the greatly increased operating costs which the short-line carriers must bear in order to handle said foreign interchange equipment.

ESTABLISHMENT OF EIGHT-HOUR DAY OPPOSED

This practice also adversely affects the morale of the railway operating forces and has the effect of slowing down plant efficiency. Railway operations are based upon tonnage and mileage as the chief and controlling factors. When trains are made so large in tonnage loading, ranging from 50 to over 100 cars per train, the traffic can of course be handled with less train and engine mileage, but this causes increasing losses in car-day movements and reduction in service to the public because of holding trains for maximum tonnage.

It has been proven that railway employees are as much interested in having good jobs as they are in a high unit-rate of pay, and this has been demonstrated in the past by the fact that the "good-job road" has been considered superior to the "maximum-wage road." In other words, train- and engine-men prefer to work on a road where they get

over their divisions in good time, rather than work on a road where the trains are heavily loaded and move at the minimum of speed and their pay, if it is high, comes largely from overtime payments. With few exceptions, this is the opportunity and the incentive that is lacking on trunk-line railroads today, and it is the cause of unreasonably poor service to the public and loss to the carriers. Everything has been sacrificed to maximum or drag-freight train-loading with the result that it has been found necessary to increase the rate of pay of train- and engine-men from time to time to fixed bases, because of the lessened opportunity to make an adequate wage from a sufficient monthly mileage at unit rates of pay.

Under the new wage scale recently ordered by the Railway Labor Board, the rate of pay of engine-, train- and yard-men varies from \$4.50 to \$7.50 per eight-hour day per 100-mile division, ranging from brakemen to enginemen, or, in other words, at the unit rate of $4\frac{1}{2}$ to $7\frac{1}{2}$ cents per mile for these road men.

The aforesaid eight-hour day mathematically calls for an average train speed of $12\frac{1}{2}$ miles per hour over a 100-mile division in road service. Freight-train speed has fallen to an average of less than 10 miles per hour. That the train- and engine-men have endeavored to furnish a better train movement is attested by the efforts which they have made before Congress in the enactment of the Adamson law establishing the aforesaid eight-hour-day basis, and before the various State Legislatures in the enactment of full train-crew laws providing that an extra brakeman shall be used if trains exceed 50 cars. The clear intent of these Acts was for the purpose of so limiting the train-load as to insure the making of an average train speed of not less than $12\frac{1}{2}$ miles per hour between terminals in order that engine- and train-men could make their runs in better time and have more leisure time at home with their families, while at the same time making a fairly adequate compensation by the application of their unit rates of pay to more miles in the aggregate per month by this expedited train movement than is possible under the aforesaid drag-train movement. This, of course, would be clearly in the interest of the public service and, when properly considered, would result in profit to the carriers flowing from greater use of their locomotive and car equipment and, therefore, in resultant increased revenues from traffic that cannot be moved on the drag-train basis. This, however, has failed of fulfilment because the carriers have continued the policy of drag-train operation and the payment of heavy overtime wages to their employees.

The present craze for tonnage records among railway executives is responsible for the delay and the losses which are cast upon our producers at seasonal periods during practically every year. Subordinate operating officials in charge of divisions on most of the trunk-line

companies have no authority to reduce tonnage in order to meet conditions when traffic becomes unusually dense, or, if they have such power, they are reluctant to incur the risk of criticism from the officers higher up, that their operating sheet at the end of a given month may not show the maximum of so-called tonnage efficiency.

While everincreasing-capacity locomotives and cars are being purchased and the train load increased as rapidly as possible—comprising more than 100 loads and the double-heading of consolidation engines in order to move such trains and get them over certain trunk-line railways within the sixteen-hour law—the officers on the ground in charge of freight divisions are without power to enlarge the track capacity of freight division terminal yards, or to extend sidings sufficiently to accommodate such trains, there is, therefore, serious delay to all transportation movements due to the necessity of “sawing by” opposing trains on the line, the blocking of terminal yards, and also the blocking of main-line sidetracks. In other words, the train-load capacity is constantly being built ahead of yard-track and sidetrack capacities, and this is one of the reasons why the movement of freight is so slow; why the main-line sidetracks are blocked with cars for hundreds of miles when there is a congestion causing an interruption of traffic; and why it is necessary to hold train- and engine-crews on the line in excess of eight hours, often tying up for rest within a few miles from the division point at which they live, resulting in severe losses in engine- and car-mile days and in the payment of unnecessary overtime.

It is of record that a prominent transcontinental railroad president, testifying in opposition to the eight-hour law, made the following statement at the hearing before the Senate Committee on Interstate Commerce on August 31, 1916:

If, under duress, they (the employees) can force us to part with sixty million dollars, why, that will be an admirable method for dealing with the question of time-and-a-half overtime. In time, however, I have not a particle of doubt—it may be six weeks, or six months, or a year, or two years—but it is just as certain as the sun sets today that ultimately the public will have to pay the bill, because the public will realize that it must have these railway facilities, cost what they may, and they will have to meet the increased rates.

DRAW FREIGHT-TRAIN OPERATING CONDITIONS

It is also of record from the testimony of witness Clark (pages 405-410 of the record) before the Federal Wage Commission at Washington, D. C., during 1918, that the inauguration of the eight-hour day had resulted in an enlarged output per man per hour in yard service, because of the ability of the yard crews to “work with more pep on the shorter shifts than on the long ones.” But as to road service the contrary was shown to exist—that the train loading had not been so

regulated as to make effective a train-movement application of the eight-hour law; that, while the Act made eight hours the basic day rate of pay, there is no inhibition against working the crews double time or as much thereof as necessary, and paying overtime for service in excess of eight hours; and that this is the procedure that is being followed. Mr. Clark gave the following interesting descriptive résumé of present operating practices:

While the average freight train a generation ago consisted of 25 to 50 cars and weighed 1,000 tons or thereabouts, the typical "drag freight" of today carries double the number of cars and three times the tonnage of its predecessors.

Numerous are the changes that delay these long trains, especially in the present transitional stage of their operation. Though grades have been lowered and smoothed out, they become jumpy from season to season with the settling and reballasting of the track. So finely worked out are engine ratings on some divisions that even these changes may cause a train to stall. Climatic conditions, such as heavy snow, or wet rails, or a strong head wind, or a sudden cold snap, will retard a train whose locomotive is pulling its very maximum. Sidings have not been built long enough to hold these big trains, and so when two of them meet they must "saw past," as railway men say; or it may be necessary to break a train on two sidings several miles apart, and for the locomotive to double-back this distance and pick up the rear half of its train after a passenger has gone ahead or another freight has passed. Still greater are the delays caused by insufficient trackage in terminals. Even yards recently laid out and designed to handle traffic for fifty years ahead, like the Minoa yard near Syracuse, have no tracks that will hold 100 cars. Therefore after the engineer of such a train receives the signal that the main track is clear ahead he must pull out on the main track, back down one or more yard tracks to pick up the rear section of his train, pump up his air, and get away—a process that takes from 20 minutes to an hour. * * *

While the rolling stock can be brought up to the condition required by new operating policies quicker than tracks and yards, the engines and cars on American railways are still inadequate to the tasks that ambitious managers and superintendents have imposed upon them. A long train may contain cars from a score of railroads, differently constructed and maintained, and of various ages and design. Many were never intended to stand the pull of 3,000 or 4,000 tons behind them, and so must be placed well toward the rear, though they belong to the same cut, carry the same kind of contents, and are to be set out at the same station as modern steel cars located on account of their weight and strength immediately behind the locomotive. This inconvenient arrangement doubles the time required to deliver such cars en route. * * *

No question exists as to the added labor and responsibility of operating heavy-tonnage trains. The fireman has to shovel

more coal; the engineer has to manipulate his engine with more skill, to nurse his steam with more precaution, and to concentrate more attention on his brakes. A conductor's clerical work is increased roughly in proportion to the number of cars he handles; and he and his brakemen have more repair work to do, more inspections to make, and longer distances to walk on heavy-tonnage trains than on light ones. To walk some trains now running in the West is a mile's hike, and when such a train breaks, as usually happens, well ahead of the middle, the place must first be inspected to see what is wanted, then a back trip is made to the caboose for tools, bolts, chains, or other supplies, which must be lugged forward to the point where they are needed. An instance was observed where it took more than thirty minutes, without unnecessary lost time, to inspect a broken coupling and laboriously to bring forward repair materials from the caboose. * * *

The first grievance voiced by railway employees is excessive and irregular hours of labor; their second grievance is overloaded trains. These two conditions are associated, and the second is usually given as the reason for the first. The hostility of railway workers to heavy tonnage, however, is based on more grounds than protracted working hours. * * * The influence of big trains is seen in the numerous demotions of engineers to firemen and of conductors to trainmen on divisions where heavy tonnage has recently been adopted. Long trains moving slowly have lessened the mileage which a train crew can make, have abolished many attractive short-time runs, and have partly nullified the benefits which employees anticipated from wage advances. The general chairman of the conductors on a large western system said:

"Up to 1903 freight conductors got 3 cents a mile. They now get 4.18 cents a mile, but make less money on a mileage basis than under the old rate on account of the long time it takes them to get our heavy trains over the road. In drag-freight service payment is practically on a time basis now."

This statement is a representative picture of freight-train operating conditions on trunk-line systems today. It speaks for itself and explains why such slow freight service is rendered to the public, why there is congestion and car shortages, and why the morale of the train- and engine-men may be lower today than in former times antedating drag-train loading and operation. It is idle to say that high efficiency can be long maintained when there is constantly held before these road men the prospect of "demotion" rather than "promotion" under the present policy of everincreasing train loading.

Aside from exceptional occurrences, fifty-car train units should be the maximum freight-train load in order to secure the highest operating efficiency by consulting the welfare of the train- and engine-men and affording proper opportunity for promotion at regular intervals—

the goal for which all good men strive—and in order to cut down excessive overtime payments and obtain greater car and locomotive use than at present. On the basis of present maximum train-loading operations, the carriers have lost sight of the highly cooperative efficiency which would otherwise flow from their employees and the public by attention to better accomplishments of tonnage moved per train-hour and are failing to produce a reasonably adequate output of transportation because of basing their operations on maximum tonnage per train-mile with its consequent loss in equipment use and heavy investment and maintenance costs. An increase in the present train-movement speed of less than 10 miles per hour to a speed averaging from 12½ to 15 miles will result in an improved operating efficiency and give to the public a largely increased supply of cars, clear up the present congestion and car shortage, and, at the same time, give the carriers the benefit of a large increase in revenue from traffic which is not now moving because of said congestion and car shortage. The remedy for this situation is certainly not to be found in the purchase of further enlarged equipment and increased train-loading with slower movement per locomotive and per car per day.

BURDEN UPON CARRIERS TO MAKE GOOD

Notwithstanding that freight traffic has been available in unprecedented volume and that movement thereof during the spring and summer months of the current year has been only slightly in excess of the traffic handled in 1916, and has not equaled the volume transported in 1918, the United States Chamber of Commerce is complaining that the carriers have reached the point of saturation, or that traffic has almost outgrown the carrying capacity of the railroads, and it is now calling upon the shippers and receivers of freight to load cars heavier and thus make possible the saving of more than 500,000 freight cars in order to prevent an expenditure of over one and one-half billion dollars and consequent further increases in freight rates. Nothing is said, however, about increasing train-movement speed 20%, which, when applied to the 2,450,000 freight cars owned by the carriers would, while rendering an improved service to the public, make available approximately 490,000 additional cars. It is proper to keep in mind that the aforesaid organization demonstrated its pro-railroad attitude during the consideration of the guaranty-return provision of the Esch-Cummins bill, and that it is still running true to form.

The carriers contend that it is necessary to add to their present equipment 100,000 freight cars, 2,000 locomotives, 3,000 passenger cars, and 1,000 baggage cars, but while orders have been placed, it is

conceded that this equipment cannot be constructed and made available for service this year.

In this connection it may be noted that during war operations from May 1, 1917, to March 1, 1920, the War Department used 247,443 cars which were handled in 21,421 trains and engines, comprising 83,815 Pullman cars, 118,000 coaches, 15,084 baggage cars, 3,503 kitchen-and-dining cars, 12,920 box cars, and 13,881 other freight cars, all of which equipment is now released for domestic uses in private operations. Under the strike conditions which obtained throughout the eastern industrial sections during the spring months, it was conceded that additional equipment would have intensified rather than have relieved the congestion. In any event, the carriers cannot be heard to complain until they have made good their promises that more efficient operation would be produced under private operation than under federal control, or until they have restored the fast freight-train schedules, the running time of which was reduced two miles per hour during government control, and until they have handled in excess of the tonnage transported by the Railroad Administration for the year 1918.

It is time for the trunk-line carriers to put their own house in order from within, instead of undertaking through class association and misleading propaganda to cover up wasteful investments and inefficient operations, and to dictate the form of government that the people of the forty-eight States shall have for the future.

The trunk-line carriers have been generously treated during the period of the war, being paid a guaranteed return on the basis of the three highest earning years (ending June 30, 1917) ever experienced by American railroads, and, at the same time, saved free from war burdens that otherwise under private operation would not have permitted railway stockholders to make net earnings aggregating nine hundred million dollars per annum, which was guaranteed and paid to them by the Government. There is a limit to which rates may be horizontally advanced, and that such limit has been reached is recognized by many practical far-seeing railway officers. Almost without exception, the railway officers of this State recognize the impracticability—in fact, the impossibility—of attempting to apply a horizontal increase on all rates without regard to the character of the traffic and continued development and prosperity of the communities served, upon which their lines are dependent for business—in fact, for their very existence.

VALUATION AND EARNINGS OF NEVADA RAILROADS

In reaching its conclusion and in fixing the aforesaid horizontal increases in rates, in Ex Parte 74, the Interstate Commerce Commis-

TABLE A

Name of Carrier	Nevada road mileage	Carriers' book cost value	I. C. C. determined aggregate value	Nevada Commission's value	Gross earnings Nevada System, 1919	Net earnings Nevada System, 1919	Net earning return on Nevada Commission's value
Atchison, Topeka and Santa Fe Railway	11.68	\$150,264.09	\$141,698.95	\$67,667	\$1,980	\$125	1.84%
Burlington Railroad	86.59	1,846,339.37	1,741,097.67	\$79,295	53,918	49,893	18.93%
Southern Pacific Company (Central Pacific)	746.27	85,593,831.74	80,630,112.00	43,025,145	17,118,448	8,146,436	14.98%
Eureka Nevada Railway	84.60	484,361.20	456,752.42	161,195	2,316,275	24,166	4.18%
Los Angeles and Salt Lake Railroad	266.94	21,322,900.26	20,107,494.70	13,784,449	2,316,275	573,802	2.05%
Nevada Central Railroad	93.30	1,505,860.00	1,420,025.98	125,000	41,141	2,546	6.47%
Nevada Copper Belt Railroad	41.47	1,147,336.27	1,081,937.84	250,000	95,548	16,187	7.48%
Nevada Northern Railway	168.08	3,594,320.49	3,389,443.76	3,694,320	1,367,548	268,292	3.75%
Pioche Pacific Railroad	16.08	\$200,000.00	188,600.00	50,000	10,073	874	4.03%
Tonopah and Goldfield Railroad	97.37	3,714,044.08	3,502,343.48	2,205,391	327,368	98,820	4.63%
Tonopah and Tidewater Railroad	30.96	624,105.26	4,588,531.01	1,000,000	310,486	46,329	12.40%
Virginia and Truckee Railway	67.48	4,452,954.60	4,199,135.92	1,000,000	310,486	46,329	
Western Pacific Railroad	427.26	21,874,233.70	20,627,401.71	14,830,460	3,924,180	1,776,377	
Totals	2,137.96	\$146,420,551.04	\$138,074,571.15	\$79,115,222	\$25,666,863	\$10,970,649	13.87%

NOTE—I. C. C. determined aggregate value found by deducting 5.7% of carriers' aggregate book cost value.

Net earning return on Nevada Commission's value.....13.87%

Net earning return on I. C. C. determined value.....7.80%

Net earning return on carriers' book cost value.....7.40%

*Deficit. †Estimate.

sion reduced the book-cost investment as contended for by the carriers, for the United States as a whole, from twenty billion dollars odd to approximately nineteen billion dollars, or a reduction amounting to 5.7%. Reducing the book-cost value of the Nevada carriers by this percentage, there appears in Table A, respectively, carriers' book-cost value, the I. C. C. determined value, Nevada Commission's value heretofore used for rate-fixing and taxation purposes in Nevada, and the gross and net earnings, including the net return on the Nevada Commission's value within the State of Nevada, on the carrier's book-cost value, and on the I. C. C. determined value.

It will be observed from Table A that the aggregate book-cost value of the carriers, covering an operating mileage of 2,137 miles within Nevada, is \$146,420,551; that the I. C. C. determined aggregate value is \$138,074,571, while the Nevada Commission's value is \$79,115,222, and that the net income return averages 13.87%; 7.89% upon the I. C. C. value, and 7.46% upon the carriers' book-cost value. It is to be noted that the earnings used are for the year ending December 31, 1919, and that they do not include the wage increases which have recently been made by the Railway Labor Board, but which, by themselves considered, will not reduce the net earnings of the Nevada carriers to exceed 20%. Assuming such a reduction, there would be remaining as net earnings within Nevada \$8,776,518, or a return of 11.10% on the Nevada Commission's valuation, of 6.4% on the I. C. C. determined aggregate value, and of 6% on the carriers' book-cost value.

Taken collectively the carriers in Nevada are making better than the prescribed return fixed by the federal law, and, therefore, except for the question of jurisdiction raised, there could be no good reason why the proposed horizontal rates should be further considered.

TREATMENT OF VALUATION

The record shows that the Interstate Commerce Commission's determined aggregate value of railway property for the United States as a whole is eighteen billion nine hundred million dollars, compared with which the net par value of all stocks and bonds outstanding is approximately seventeen billion dollars, and the market value thereof was approximately fourteen billion dollars, based on the first week in June, 1920.

As to the justification of using the market value of securities as a measure of reasonable value in the absence of any other reliable standard, it was said in *San Diego Land & T. Co. v. Jasper*, 189 U. S. 444:

Of course it is hard to answer the proposition that value expressed in money depends on what people think at the time. That determines what they will give for the thing, and,

whether they think rightly or wrongly, if they or some of them will give a certain price for it, that is its value then.

And to the same effect the Interstate Commerce Commission said in *Texas Railroad Commission v. A. T. & S. F. Ry.*, 20 I. C. C. 475:

While it is true that market quotations are subject to many influences that have little relation to earning power, nevertheless, in the absence of a physical or inventory valuation, or of an opportunity to investigate the company's early books of account, the market value is the only means now available to us for arriving at any impression as to even the approximate cash value of the property at the time of its reorganization.

Where questions of value have arisen in Nevada, this Commission has treated the matter by fixing a reasonable value, as above noted, which, under all the circumstances, would seem to be just and fair to the carriers and the public in the different cases. This procedure has been found necessary in order to give to the public a just and reasonable rate, as well as to provide a fair return for the carriers. In no case have we ever accepted or even considered adopting the accumulative book cost as a basis for the fixing of railroad and utility rates in our State, and, from the figures set forth in the table (Table A), we are unable to see how we can, in justice and fairness to our State, do so for the future. The right and duty of the State regulating authority to proceed in this manner has been many times laid down by the courts.

In *San Diego Land and Townsite Co. v. United States*, 174 U. S. 735, it is said:

A fair return to which the owners of the property are entitled cannot always be based upon the total amount invested, because some portion of that which is required by the investment may be neither necessary nor presently useful for the public service; but the fair return is to be based upon the fair present value of that which is used for the public benefit, having due regard always to the reasonable value.

To the same effect, in *Cornell v. Edwards*, 144 U. S., in speaking of the value of a railway, the Court said:

The value of the service rendered by the company to the public is a matter to be considered. In the case before us, if the earning capacity of the railroad, present and prospective, really is as small as appellant claims, it may be doubted whether the road is worth what it cost.

Original cost is not a fair criterion of present value, because the plant may have cost too much or it may be of unnecessary dimensions. (*Wilcox v. Con. Gas. Co.*, 212 U. S. 19.)

The principle is further illustrated by the reasoning of the court in *San Diego Land & Townsite Co. v. Jasper*, 189 U. S. 439, wherein the Court said:

If a plant is built as probably this was for a larger area than it finds itself able to supply, or, apart from that, if it does not have the customers contemplated, neither justice nor the Constitution requires that say two-thirds of the contemplated number should pay a full return.

And again, in *Southern Pacific Co. v. Bartine*, 170 Fed. 175, the Court, in refusing to hold that the application of maximum legislative freight rates on the San Pedro, Los Angeles and Salt Lake Railroad were confiscatory, said :

If a railroad is built into a new and sparsely settled territory with a view of serving a large future population and developing business, the Constitution does not require the few people and the small business of the present time to pay rates which would yield an income equal to the full return to be gathered when the country is populated and business developed to the full capacity of the road.

And again, in *Water District v. Water Company*, 99 Me. 371, the Court said :

Suppose that a 500-horsepower engine was used for pumping when a 100-horsepower engine would do as well. As property to be fairly valued, the larger engine might be more valuable than the smaller one and it could not be said that it would be reasonable to compel the public to pay rates based upon the value of the unnecessarily expensive engine.

Under Interstate Commerce Act, sec. 15, subd. 4, providing that "the Commission shall give due consideration to all the elements of value recognized by the law of the land for rate-making purposes, and shall give to the property-investment account of the carriers only that consideration which under the law it is entitled to, in establishing values for rate-making purposes," the Federal Commission is clothed with power to apply these principles in fixing the valuation of railway property at a reasonable standard for the purpose of insuring reasonable rates to the public.

IN RE DEPRECIATION

An important feature in connection with reasonable value and fair rates that is worthy of attention and correction is the matter of depreciation reserves that have been and are being used for the purchase and replacement of heavier equipment and facilities for lighter ones, which, over and above salvage value, have been charged in part to operating expenses and in part to capital account, and therefore the public is constantly being required to pay increased operating expenses and earning returns upon enlarged carrier property, although these enlargements may be in excess of present needs and therefore wasteful in operating costs. The effect of this policy is, in so far as possible,

to require the public not only to maintain but to reconstruct the railroads to a higher standard, thus relieving the owners from their obligation to provide for necessary capital investments, while at the same time enabling them to enjoy this growth in property value and earning returns by such application of depreciation reserves and charges to operating expenses.

In the *Cumberland Telephone Case* (212 U. S. 414) the disposition of depreciation reserve fund was under consideration and in reversing the Circuit Court of Appeals, in granting an injunction against rates fixed by the Louisiana Railroad Commission, the Supreme Court said:

It certainly was not proper for the complainant to take the money, or any portion of it, which it received as a result of the rates under which it was operating, and so to use it, or any part of it, as to permit the company to add to its capital account upon which it was paying dividends to shareholders. If that were allowable, it would be collecting money to pay for depreciation of the property, and, having collected it, to use it in another way, upon which the complainant would obtain a return and distribute it to its stockholders.

Further, the question of accrued depreciation enters into the calculation of the value of all railway properties, including those which have a going-concern value made up of sufficient business to justify the full productive use of the property actually and beneficially devoted to the public service. This principle is covered by the United States Supreme Court in *Knoxville Water Case*, 212 U. S. 1; *Consolidated Gas Case*, 212 U. S. 19; *Cumberland Telephone Case*, 212 U. S. 414; and in the *Minnesota Rate Cases*, 230 U. S. 352, wherein the Court said:

The cost of reproduction is not a fair measure of value unless a proper allowance is made for depreciation, because all constructive portions of a plant are subject to deterioration and to be worn out or consumed by use. * * * The realization of the benefits of property must always depend in large degree on the ability and sagacity of those who employ it; but the appraisalment is of an instrument of public service, as property, not of the skill of the users. And when particular physical items are estimated as worth so much new, if in fact they be depreciated, this amount should be found and allowed for. If this is not done, the physical valuation is manifestly incomplete.

In defining the function of depreciation in *Kansas City Southern Railway v. United States*, 231 U. S. 423, the Court quoted with approval its finding in *Knoxville Water Case*, 212 U. S. 1, and said:

This Court had to do with a similar element of depreciation and, after pointing out that such a plant as was there in question begins to depreciate in value from the moment of its use, and that, before coming to the question of profit at all,

the company was entitled to earn a sufficient sum annually to provide not only for current repairs but for making good the depreciation and replacing the parts of the property when they should come to the end of their life, the Court proceeded to say:

"If, however, a company fails to perform this plain duty and to make sufficient returns to keep the investment unimpaired, whether this is the result of unwarranted dividends upon overissues of securities or of omission to exact proper prices for the output, the fault is its own. When, therefore, a public regulation of its prices comes under question, the true value of the property then employed for the purpose of earning a return cannot be enhanced by a consideration of the errors in management which have been committed in the past."

TAXATION DEMONSTRATES FALLACY OF BOOK-COST VALUE

The fallacy of using book cost is quickly demonstrated by the carriers themselves when their property is under consideration for taxation purposes. Showing is always strongly and properly made that the accumulative book cost must not be used because it does not take account of the obsolete and discarded property, and that it does not fairly measure the real value of the property then in existence and beneficially used in the public service. The state authorities, without exception, have accepted this view as sound, and a number of States, notably Wisconsin, Michigan, and New Jersey, have made inventory valuations of their railway property for the purpose of accurately establishing the actual cash value for taxation. In finding the cash value for taxation and sale, the rule being the same in both cases, there is included the intangible value made up from the earnings of the rates fixed on some basis of fair and reasonable value. (See *Monongahela Case*, 148 U. S. 312, covering condemnation or sale-value principles, and also the *Backus Case*, 154 U. S. 349, covering valuation principles for taxation purposes.) Because of the inclusion of the intangible element for sale-and-taxation purposes, there is, of course, a very clear distinction from the valuation which must be determined and used for rate-fixing purposes. The adoption of the sale-and-taxation appraisal methods for rate-fixing purposes would, without in any way increasing the service to the shipper or the cost thereof to the carrier, work out improper results because the income which is made from rates is the basis upon which the intangible elements of value are made up, which becomes property for sale-and-taxation purposes, but which, if added to the tangible value for rate-fixing purposes, would of course justify continually increasing rates.

CONGRESS IGNORES BOOK COST IN FIXING RAILROAD WAR COMPENSATION

Courts and commissions have heretofore exercised discretion to find the "reasonable value" of the property upon which the carriers should be allowed to earn a return, upon rates that were just and reasonable to the public. It may be noted in passing that Congress in 1918 exercised such discretion in finding and fixing the guaranteed return to the carriers while under federal control and operation. In fixing this compensation the average annual net earnings of the trunk-line carriers amounting to nine hundred million dollars, for the three years ending June 30, 1917, was taken as a basis, and book-cost value of the properties was ignored.

The Interstate Commerce Commission has refused in many cases to accept the carriers' book-cost investment as the basis upon which to fix rates and measure fair returns. In its annual report to Congress in 1908, page 85, the Commission said :

Every balance sheet begins with "cost of property," against which is set a figure which purports to stand for the investment. This is no place to enter upon an extended criticism of the practice of American railways in the matter of their property accounts, nor is such a criticism necessary for the purpose in hand. It is sufficient to refer to the well-known fact that no court, or commission, or accountant, or financial writer would for a moment consider that the present balance-sheet statement purporting to give "the cost of property" suggests, even in a remote degree, a reliable measure either of money invested or of present value.

And to the same effect Mr. Robert S. Lovett, of the Union Pacific, in discussing the federal "aggregate-value" section here under consideration, on December 10, 1919, said :

If "property investment" is to be taken as the guide, the more overcapitalized a railroad has been, the greater would be its value, for, until the bookkeeping rule was changed by the Commission in very recent years, all securities issued were carried in the property-investment account by most companies at par, regardless of the price received for them.

In the case of *Texas Railroad Commission v. Santa Fe Ry. Co. et al.*, 20 I. C. C. 463, the Commission, after analysis, excluded eighty-three million dollars in the book-cost value of the M. K. & T. Railway, the carriers' book cost being reduced from one hundred and ninety-one million to one hundred and eight million dollars on the ground that the book cost, as built up by the aggregate securities of subsidiary companies taken over by the parent company, did not represent tangible property in the amount above referred to as deducted. Again, in the *Western Advance Rate Case* of 1910, the I. C. C. found that the book-cost value contended for by the C. B. & Q. R. R. was five hundred and

thirty million dollars, upon which a net earning return was claimed. Of this amount, however, only two hundred and fifty-eight million dollars represented actual investment in property from sale of stock and bonds and the balance was made up of property from surplus earnings and unearned increment in land values. The actual investment as determined by the Federal Commission was three hundred and sixty-four million dollars and the amount excluded from consideration was one hundred and sixty-six million dollars.

**HEAVY EXCESS SHOWN IN BOOK-COST INVESTMENTS BY I. C. C.
INVENTORY APPRAISALS**

The record in this proceeding shows that the I. C. C. valuation department found that the book-cost value of the Kansas City Southern Railroad was reported as approximately one hundred million dollars, whereas, after an inventory appraisal of the property by the Commission's valuation experts, it was found that the reproduction cost new, less depreciation, including full allowance for land values, severance damages, etc., was less than fifty million dollars. For the Tonopah and Goldfield Railroad, covering 113 miles of line in Nevada, where the aggregate value was reported at \$3,700,000, the Commission's valuation experts have found that the reproduction value new, less depreciation, is approximately \$1,700,000; that, whereas the book cost of the Los Angeles and Salt Lake Railroad within Nevada is \$21,322,000, the Federal Commission's appraisal value is \$13,704,000; that, whereas the book cost of the Western Pacific Railroad within Nevada is \$21,874,000, the Federal Commission's appraisal value is \$14,330,000; that, whereas the book-cost value of the Southern Pacific in Nevada is \$85,503,000, the valuation placed in evidence before this Commission by the company's valuation engineer, Mr. J. B. Pope, is \$51,614,000; that the book-cost value of the New Orleans, Texas and Mexico Railway, the Kansas City Southern system, the St. Louis Southwestern, the Texas Pacific, and the Trinity and Brazos Valley systems, comprising a mileage of 4,789 miles, was found to be \$332,125,000, while the Federal Commission's tentative appraisal valuation is \$160,659,000.

These comparisons indicate how excessive is the aggregate value contended for by the carriers in this proceeding and how unjust it would be to burden the public with rates high enough to pay a return thereupon. The I. C. C. appraisals above shown are predicated upon unit costs for the year 1914, or prior to the abnormal war-cost period. The carriers have very strongly contended and do now contend that the value of their properties should be measured upon the basis of the present abnormal unit costs and that if such costs are taken, the book-cost investment of twenty billion dollars, which they contend for, is a just and reasonable valuation basis.

EX-JUSTICE HUGHES FINDS REASONABLE VALUE

As indicative of what is a fair and reasonable valuation basis, it will be helpful to refer to the impartial opinion rendered by that able jurist, Ex-Justice Charles Evans Hughes, wherein, as referee in the case brought by the Brooklyn Borough Gas Company against the New York Public Service Commission (17 N. Y. Official Department R. 81; P. U. R. 1918-F. 335) to restrain the enforcement of an 80-cent gas rate, he said:

While it is important to consider the cost of present production in determining the fair value of a plant for rate-making purposes, it cannot be said that there is a constitutional right to have the rates of a public service corporation based upon the estimated cost of reproduction of its property at a particular time, regardless of circumstances. To base rates upon a plant valuation simply representing a hypothetical cost of reproduction at a time of abnormally high prices, due to exceptional conditions, would be manifestly unfair to the public, and, likewise, to base rates on an estimated cost of reproduction far below the actual bona-fide and prudent investment, because of abnormally low prices, would be unfair to the company.

If, however, we are not to take the actual cost of reproduction at the present time, or within a year or so, because it would be an abnormal cost, and we are to seek some fair basis of estimating the value of plaintiff's property for the purpose of determining the validity of rates, it would be difficult to find any basis more just than the appraisal carefully made by public authority, and based on reproduction cost before the outbreak of the European war, with proper consideration of the actual investments since that time.

The Supreme Court of the District of Columbia, in an opinion rendered March 2, 1920, covering a rate case upon complaint of Capital Traction Company v. Public Utilities Commission of the District of Columbia, P. U. R. 1919-F. 779, quotes with approval the aforesaid sound reasoning of Ex-Justice Hughes. Speaking of reproduction cost, the Court said:

It would lose all value if made as of an abnormal period, when prices were abnormally low or high. To be of any assistance or real use, it must be made as of a normal time, and the unit costs applied thereto should extend over a sufficient number of years to show a normal trend of prices. The adoption by the Public Utilities Commission of the date of July 1, 1914, as that to which the inventory was to be made and normal unit prices applied, was reasonable and proper and its action in so doing has the sanction of the highest legal and engineering authorities.

This reasoning is sound, and will stand the test of analysis, for the reason that if the present unusual and abnormal range of unit costs shall continue for a term of years, they will, through renewals and

additions and betterments, bring the value of railroad properties up to such a standard of actual value as to ultimately receive an adequate earning return thereon from the communities which they serve.

REASONABLE VALUE, JUST COMPENSATION, AND FAIR RATES

The said authorities, it will be noted, give entire approval to the regulating authorities of this country for disregarding book-cost value, or even actual cost and reproduction (new) values, and for finding a "reasonable value" that will be fair under all the circumstances in the different cases presented.

In finding reasonable value for the purpose of fixing just compensation to the carriers and fair rates to the public, it is proper to make a fair apportionment or no more than a fair allowance for excess-capacity equipment and facilities that are built into the future, and for which the carrier has not a full productive use at the time of the inquiry. (*Goldfield Water Co. v. Nevada Public Service Commission*, 236 Fed. 979.) It is also pertinent to inquire into what division of the aggregate value comprises road and what part equipment—this for the reason that many lines have a costly and high standard roadway that is sufficient to handle much more traffic than they are moving. In some cases the roads have not the traffic, and in other cases they may not own a sufficient amount of equipment, or, because of slow train movement, the freight cars do not reach their lines fast enough to enable them to transport a greater volume of traffic than they are handling.

When necessary a careful examination and a revision of operating expenses is also justifiable for the protection of the public. (*Railway v. Wellman*, 143 U. S. 345; *Tonopah and Goldfield Railroad v. Nevada Railroad Commission*, 184 Fed. 358.)

In holding excessive expenditures invalid in these cases, the Court said:

While the protection of vested rights of property is a supreme duty of the courts, it has not come to this, that the legislative power rests subservient to the discretion of any railroad corporation which may, by unreasonable expenditures, or in some other improper way, transfer its earnings into what it is pleased to call operating expenses.

We are unable to see how the Commission, in this proceeding, can do otherwise than to follow these well-adjudicated fundamental principles, in working out its valuation of railroad property for rate-fixing purposes. This is the rule which we have followed in the past, with satisfaction to the people and prosperity to the carriers of Nevada. We see no reason for adopting a new and untried theory at this time, thereby casting an unjust burden upon our industries, producers, and consumers.

THE TESTIMONY OF RECORD

Following the statement of the position of the carriers, this Commission introduced and made of record, in so far as applicable, the testimony taken before the Interstate Commerce Commission May 24-July 6, 1920, at the hearing and investigation in I. C. C. Docket Ex Parte 74. This record comprises 27 volumes of testimony, embracing nearly 6,000 pages, and 9 volumes of exhibits, embracing 5,000 pages. This Commission also introduced and made testimony of record all railroad tariffs, rules, and regulations governing state and interstate traffic, all annual and monthly reports of the carriers, and all reports and decisions of this Commission, the Interstate Commerce Commission, and the Courts affecting the rates and jurisdiction of this State in the proceeding here under consideration. This tender was objected to by the carriers on the ground that the decision of the Interstate Commerce Commission in Ex Parte 74 was controlling, and that this Commission was without jurisdiction to consider any testimony which might result in producing a different finding than that prescribed by the Federal Commission.

RATES CONFISCATORY OF NEVADA MINING INDUSTRY

In Docket Ex Parte 74, the Interstate Commerce Commission apparently considered that it was acting under a direct mandate from Congress to authorize the carriers to fix such rates as would produce a net earning return of 6% on the aggregate value of carriers' property for the ensuing two years.

That the Federal Commission did not consider the reasonableness of the rates *per se* is made clear by its delegation of authority to the carriers to depart from the order and make adjustments, or, in other words, to apply such rates as the traffic will bear. The reasonableness of the rates has not been measured, nor is there any standard by which the carriers are required to fix rates to the shippers and the public, and, as to interstate traffic, they may fix rates closely bordering on the line of confiscating the entire value of traffic and of community enterprise. The fact that the reasonableness of the rates has not been measured is further emphasized by the testimony which the Chairman of this Commission put in evidence at the hearings in Washington on June 12, 1920, wherein it was shown that a further 25% horizontal increase in freight rates would close practically all of Nevada's shipping mines. This was illustrated by showing that the net earnings of the Nevada Consolidated Copper Company of Ely, Nevada, were \$336,000 in 1919, and that, if said increase in rates was applied on coal, coke, and supplies, inbound, and on blister copper outbound, but not including the movement of ore to the smelter, the increase would amount to \$345,000, or \$9,000 in excess of the net earnings. Further,

it was shown that the Virginia Louise Mining Company of Pioche, Nevada, which is operating on the very slender margin of profit of 50 cents per ton, and which has been and is now affording the Salt Lake Railroad a revenue of over \$300,000 per year, would be completely put out of business by the aforesaid increase in freight rates, with great loss to the company, the Pioche Mining District, and the railroad.

To the same effect Messrs. S. H. Williams, S. B. Elbert, and George H. Ryan, operating copper, lead, and zinc mines at Ely, appeared before this Commission at the hearing on August 16 and 17 and showed that they were operating producing mines; that during the past three years they had paid railroad charges covering interstate shipments of ore to Utah and mid-continent smelters and refineries amounting to \$160,000, and that the proposed increase in freight rates would close down their operations with heavy loss to them, the community, and the railroads. When the carriers were asked if they desired to cooperate with this Commission in working out a solution of these concrete problems, the leading representative for the carriers replied in the negative, and advised that the mining companies take the matter up with the interested carriers for adjustment as ordered by the Interstate Commerce Commission.

John G. Kirchen, president of the Nevada Mine Operators' Association, appeared at the hearing and protested against the proposed increase in rates, contending that it would result disastrously to the mining industry of Nevada, to the agricultural and livestock sections that are dependent on the mining camps for a market, and to the carriers by a loss in tonnage. He showed that the mines of Nevada are located on branch and short-line railroads and because of the light traffic and high-cost conditions rates are already as high as the traffic will bear. Illustrating this assertion, he showed that the freight charges on a 50-ton car of cyanide from Niagara Falls, New York, to Hazen, Nevada, amounted to \$27.50 per ton, or \$1,375 for the 2,500-mile haul to Hazen, whereas, for the two-line 200-mile haul from Hazen to Tonopah the charges were \$32 per ton, or \$1,600 for the 50-ton car. Thus the total freight charges of \$2,975 increased 25% would be \$3,720 for the 50-ton car, compared with which the purchase cost of the commodity is \$4,300 at Niagara Falls.

Mr. J. G. Crumley, representing the Tonopah-Divide Chamber of Mines, also appeared before the Commission, and, in addition to making a vigorous protest against the proposed increase in rates, showed that it would react against railroad earnings as well as result in grave injury to the mining communities served. He asked for and was granted time in which to exemplify the adverse effect which the action would have on various mining, milling, and smelting companies throughout southern Nevada.

Mr. E. H. Walker, representing the Reno Chamber of Commerce, The Greater Carson Club of Carson City, Nevada, and various other commercial organizations of the State, appeared before the Commission and, in addition to making a vigorous protest against the proposed horizontal increases in rates, submitted exhibits showing the valuation and operating conditions of the various railways within Nevada, from which it was made to appear that the net income for the year 1919 and for the year ending May 30, 1920, amounted to a compensatory return upon the property of the trunk-line carriers and also for some of the short-line carriers operating within Nevada. As illustrative of the higher rates in Nevada than in other sections of the country and as illustrative that, generally speaking, the Nevada rates should not be further increased, especially by horizontal raises, Mr. Walker put in evidence rate exhibits showing charges per ton-mile comparatively from Reno to various Nevada points and from Sacramento, Calif., to the same points. Illustrating the class-rate situation, he showed that the first-class rate from Reno to Elko, Nevada, is \$1.44, whereas from Sacramento to Elko the rate was shown to be the same (*i. e.*, \$1.44), notwithstanding the longer distance haul. Further, that whereas the first-class rate from Sacramento to Lovelock was \$1.06 and, because since increased 25%, is now \$1.32½ per cwt., the rate from Sacramento to Reno for a 100-mile shorter haul is also \$1.32½.

NEVADA FREIGHT-RATE SITUATION

As illustrative of the class-rate situation in Nevada, the Southern Pacific maintains a first-class freight rate of \$14.30 per ton for 100 miles, which if increased 25% would be \$17.90, whereas in California this company's first-class freight rate for a similar distance of 100 miles is \$6.30 per ton, and when increased 25% will be only \$7.90 per ton. This answers the carriers' suggestion that this Commission should follow the lead of the California Commission in promptly authorizing the horizontal increases in rates ordered by the Interstate Commerce Commission. Nevada's rates have heretofore been and are now relatively higher than in other States. This is made clear by the rates maintained by different carriers in Nevada, Idaho, Utah, Montana, Oregon, and California, which are set forth comparatively in Table B.

As further indicative of the Nevada freight-rate situation, it may be noted that for a 200-mile service east-bound from Reno the present first-class rate is \$25 per ton, compared with which the rates for similar services prior to the Federal Commission's order in Ex Parte 74 were as follows: North-bound from New York City, \$10.30 per ton; north-bound from Richmond, Va., \$11.90 per ton; east-bound from New Orleans, \$19 per ton; west-bound from Chicago, \$10.40 per

TABLE B

Class and Commodity Rates in Effect Prior to August 26, 1920, within the State of Nevada compared to Rates within the States of Washington, Oregon, California, Montana, Utah and Idaho

Rates are shown in dollars and cents per ton except as noted

Name of Carrier	50 miles		100 miles		150 miles		200 miles		300 miles		400 miles	
	Class 1	Class 5	Class 1	Class 5	Class 1	Class 5	Class 1	Class 5	Class 1	Class 5	Class 1	Class 5
Flour—												
W. P. Co.—Nevada.....	\$2.30	\$4.90	\$15.80	\$2.00	\$19.00	\$11.00	\$28.00	\$14.40	\$38.50	\$19.30	\$38.50	\$19.30
S. P. Co.—Nevada.....	9.30	5.50	14.30	8.50	19.50	11.30	25.00	14.40	32.80	18.80	38.50	19.30
S. P. Co.—California.....	3.00	2.30	6.30	4.50	11.30	7.80	15.00	9.40	15.30	7.10		
N. P.—Montana.....	8.00	4.00	12.50	6.30	15.50	7.80	18.00	9.00	22.80	11.50	27.50	13.80
O. W. R. and N.—Oregon.....	8.00	4.00	12.50	6.30	15.50	7.80	18.00	9.00	22.80	11.50	27.50	13.80
O. W. R. and N.—Washington.....	8.80	5.60	13.80	7.00	17.00	8.50	19.00	10.00	25.00	12.50	30.30	15.30
*U. I. C.—Idaho and Utah.....	10.00	6.30	15.00	7.50								
O. S. L.—Utah and Idaho.....	7.50	5.40	11.00	6.50	13.00	7.00	16.50	9.00				
Commodities												
Flour—												
S. P.—Nevada.....				\$3.80	\$4.20							
W. P.—Nevada.....				4.30	7.30							
N. P.—Montana.....				2.10	2.30							
O. S. L.—Utah.....				2.50	2.80							
U. I. C.—Utah and Idaho.....				2.50	2.80							
Grain—												
S. P.—Nevada.....				3.80	4.20							
W. P.—Nevada.....				4.30	5.20							
N. P.—Montana.....				2.00	2.30							
O. S. L.—Utah.....				2.50	2.80							
U. I. C.—Utah and Idaho.....				2.00	2.30							
Hay and Straw—												
S. P.—Nevada.....				2.50	2.50							
W. P.—Nevada.....				4.30	5.10							
N. P.—Montana.....				1.90	2.00							
O. S. L.—Utah.....				2.50	2.80							
U. I. C.—Utah and Idaho.....				1.80	2.00							
Cattle (per car)—												
S. P.—Nevada.....				38.00	40.50							
W. P.—Nevada.....				38.00	40.50							
O. S. L.—Utah.....				25.00	27.50							
U. I. C.—Utah and Idaho.....				25.00	27.50							
200 miles												
				\$4.30	\$5.40							
				9.30	8.50							
				2.60	2.80							
				3.50	4.00							
				5.40	5.80							
				5.20	5.90							
				3.80	3.70							
				2.80	3.50							
				2.80	3.50							
				2.90	3.80							
				2.50	3.50							
				2.30	2.50							
				44.00	46.50							
				44.00	46.50							
				37.50	47.50							
				32.50	37.50							

NOTE—The above rates are published in the following tariffs:
 N. P. No. 717 series. (Applies only on Montana state traffic.)
 S. P. tariffs 90-B, 376-C, 645-B.
 O. W. R. and N., N. P. C. F. T. B. tariff No. 2, I. C. C. No. 18.
 *Utah-Idaho Central Railroad is an electric line in Utah and Idaho.
 U. I. C. R. R. traffic No. 1, I. C. C. F-9. (Applies on state and interstate.)
 O. S. L. tariff 2074-J.
 W. P. tariff I. C. C. 221.

ton; north-bound from Cincinnati, \$11.30 per ton; north- and east-bound from Kansas City, \$15 per ton; north-bound from St. Louis, \$10.30 per ton; north- and south-bound from Dallas, \$19.30 per ton; south-bound from Denver, \$17.50 per ton; east- and west-bound from Billings, \$18 per ton; west-bound from Spokane, \$18 per ton; east-bound from Salt Lake City, \$20.40 per ton; and south-bound from San Francisco, \$9.50 per ton.

HORIZONTAL RATE INCREASES INTENSIFY DISCRIMINATION AGAINST NEVADA

That horizontal rate increases should not be made because such action will intensify existing discrimination against Nevada is made clear by the following examples:

Sugar from San Francisco to Elko, a distance of 557 miles, moved at a rate of \$15.40 per ton, and as increased 25% the rate is now \$19.25 per ton, whereas the rate from San Francisco to Chicago, a distance of 2,261 miles, was \$14 per ton and with the 25% increase is now \$17.50 per ton. The long-haul rate on wool from San Francisco to Boston, a distance of 3,300 miles, was \$25 per ton and as increased 25% is now \$31.25 per ton, whereas for the shorter haul of 2,880 miles from Winnemucca to Boston, the rate was \$50 per ton and as increased is now \$62.50 per ton. In other words, the San Francisco wool-shipper's rate was increased \$6.25 per ton, while the Winnemucca wool-shipper's rate was increased \$12.50 per ton for the shorter haul and less service, by the application of said 25% horizontal increase. This is illustrative of the vice of using horizontal rate increases.

DISCRIMINATORY RATES PREVENT STATE UPBUILDING AND PROSPERITY

The low long-haul San Francisco-Boston rate is defended by the carriers upon the theory that it is a water competitive rate, whereas the Winnemucca-Boston rate is said to represent a normal compensatory rate.

Incidentally, these rates are designed, in so far as follows, to force the shipment of Winnemucca wool to San Francisco for concentration and thence reshipment to eastern points. They are illustrative of the defects which exist in the present rate structure of the country, built up, as it has been, upon old-time competitive conditions, and in furtherance of the railways' plan of parceling our country into producing zones on the one hand and into manufacturing zones on the other, and for the further purpose of promoting the sale of the maximum volume of transportation. The railways have transportation to sell; it is the commodity in which they deal and they are, therefore, interested in disposing of as much of it as possible. Manifestly, if the law of the land permits the railways to promote the sale of transportation on a

basis which will produce the maximum of long, double, and treble hauling, we must expect them to take full advantage thereof. We must also expect large combinations of capital invested in industrial enterprises to cooperate with the railroads, because, by so doing, it results in the most practical form of monopoly that can be devised. The practical effect of these artificial transportation conditions created by the large industrial and railway interests causes centralization of population and traffic at large commercial and industrial centers, subsidizes and legalizes monopoly of trade and industry at these rate-favored points by compelling the location of industrial enterprises there, to the exclusion of their location at or near the points of supply, and in turn furnishes an excuse for and makes necessary the building and maintenance of large railway terminals at those preferentially rated centers. The building of such terminals adds enormously to the investment in railroads and the cost of operation for terminal storage and switching of traffic and equipment. Expensive switching is furnished free to private industrial tracks, and the return upon these large terminal investments and the cost of the service rendered is included within and made a part of the line-haul rates, from which it follows that, without any compensating advantage, a mileage prorate of this burden is assessed against the already prejudicially rated short-haul intermediate States. Therefore these benefits and privileges, when added to the preferential line-haul rates, nourish and perpetuate said industrial monopolies in restraint of state development. The intermediate sections are compelled to contribute toward the maintenance of this monopoly by the payment of higher transportation rates and therefore higher prices for all articles of consumption than would otherwise be necessary if there were a wider distribution of industrial enterprises and population, instead of the present wasteful concentration of railway traffic at large terminals, resulting in congestion and car shortages and a frightful slowing-up of transportation and commerce during certain periods, of practically every year. Because of the aforesaid disabilities, the intermediate short-haul States lose in community upbuilding and in taxation that proportion of the population and industrial property which is rightfully theirs, but which, under the present rate structure, must be located at said large terminals for concentration, manufacture, and fabrication of the products from the resources of said intermediate States.

The vice and danger of this situation is that the trunk-line railways of this country, under the plea of an adequate reward for the unregulated expenditures of private capital invested in costly and extravagant standards of track and equipment, have been used under governmental sanction to create the monopolistic conditions herein complained of, and entirely too little attention has been given to state

welfare and development. The paramount consideration has been and still is the question of railway development and prosperity, and because of this the people of the far Western States have paid and are paying a heavy tribute for long and double hauls on those products which will bear such charges.

THE NEVADA PASSENGER-FARE SITUATION

A 20% increase in passenger fares will raise present 4-cent fares on the main trunk lines to 4.8 cents per mile; raise the present 5-cent branch-line fares to 6 cents per mile, and raise the present 6-cent short-line railroad fares to 7.2 cents per mile. A 50% increase in Pullman fares will raise the present \$2.50 rate between Nevada points to \$3.75.

As compared with present 4- and 5-cent-per-mile passenger fares on the trunk lines in Nevada, the fares in California, Oregon, Idaho, and central and eastern Utah have heretofore been uniformly upon a 3-cent-per-mile basis, and therefore the present 20% increase in fares ordered by the Interstate Commerce Commission will have the effect of increasing fares in those States to only 3.6 cents per mile. If the proposed 20% increase were authorized by this Commission, the fares on certain short-line railroads in this State would be double what they are in adjoining sister States.

In addition to Nevada the States of Arizona and New Mexico are the only other States in the Union where the trunk-line carriers have attempted to collect fares in excess of 3 cents per mile for main-line service prior to the order in Ex Parte 74. These States and Nevada have made complaint against the interstate fares on the ground that 4-cent main-line and 5-cent branch-line fares are unjust, unreasonable, and discriminatory, and that they should not exceed 3 cents per mile for the future. This action is set for hearing before Interstate Commerce Commission Examiner Keene at Los Angeles on September 22, 1920, at which time representatives of the aforesaid State Commissions will be present and submit testimony and argument.

There is no justification for the maintenance of higher than 3-cent fares on the main lines and 4 cents on the branches of the trunk-line systems within this State. Action to bring about this result by state authorities has been impossible since January 1, 1918, when the lines in question were taken over by the Government for war control and operation. Although the justice of such fares was conceded by the Directors of Traffic and Public Service of the Railroad Administration in 1918, efforts to secure an order to this effect have been unavailing. Since government guarantee of railroad compensation ceased on September 1, 1920, the jurisdiction of the State to regulate its own internal commerce has been restored. This Commission will, therefore, take

prompt action to bring about a reduction of the present extortionate and discriminatory trunk-line passenger-fare exactions between points within the State.

CONCLUSION

For the year 1919, the railroads of Nevada handled between points exclusively within the State 449,551 passengers, the earnings on which were approximately \$750,000. If the proposed 20% raise in fares is applied, the people of Nevada will be required to pay \$150,000 per annum more for their service in the future. Further, there were 2,912,202 tons of freight handled between points in Nevada during 1919 at earnings of \$1,333,463, which if raised 25% would require the people of Nevada to pay an annual increase of \$333,388 on their freight business. This is an additional tax of \$483,388 when both passenger and freight business are considered.

For said year 1919, the average fare per passenger paid between points within the State was 4.3 cents per mile, and the average freight rate per ton was 1.66 cents per mile, compared with which the average rates on all business—state and interstate—handled by the Nevada railroads was 2.79 cents per passenger, per mile and 1.13 cents per ton per mile. That these units are relatively high and serve to justify the conclusion that Nevada should be exempted from the horizontal increases here under consideration is made clear by the fact that for the United States as a whole (1918) the average passenger fare is 1.9 cents per mile and the average freight rate is 7½ mills per ton per mile.

That the Nation's transportation plant is a high-grade machine and can, with efficient management, transport a much larger volume of traffic than has heretofore been handled, admits of no argument. If, as has been promised, there is to be a return to the exercise of that old-time managerial initiative in perfecting operating and service efficiency, the carriers will, in the reasonably near future, show unprecedented operating and earning results. To the accomplishment of this result it is the duty of the federal and state regulating authorities to check operations, and assist, in so far as possible, in bringing the service up to a higher standard for the future.

Under the Public Service Commission law of this State, and the Interstate Commerce Act as aforesaid, it is the position of this Commission that it is required to consider the reasonableness of rates to the public, as well as the matter of fair earning returns to the carriers, and we do not understand that we can authorize inflexible horizontal increases as proposed in this proceeding which would have the effect of imposing unjust and unreasonable charges on the public on the one hand, and on the other of causing the drying-up of certain lines of traffic, thus resulting in a substantial loss to the carriers and a diminution in the development and prosperity of our State.

The powers of this Commission are clearly defined and restricted by the delegation of authority granted by the Legislature of Nevada. It is our duty, as we conceive it, to ascertain and fix just, reasonable, nondiscriminatory, and compensatory rates to both the public and the carriers, and we have no power to make or authorize rates which consider only the rights and the welfare of one of these parties without regard to the other. This Commission, therefore, has not the power to make an order, such as the carriers demand, authorizing sweeping changes in every rate throughout the State without regard to their reasonableness; and in this proceeding the carriers have refused to enter upon an investigation as to the reasonableness of the present war-emergency rates of 1918 and the further increased rates here under consideration.

Without at this time passing upon the reasonableness of the freight rates which were increased 25% by the Railroad Administration in 1918 and which are said to have closed down a certain proportion of our operating mines, but with the understanding that the carriers may continue to apply said rates pending complaint to and adjustment by this Commission, we are of the opinion that the applications of the carriers for authority to horizontally apply percentage increases to the present freight and milk rates, and to passenger, Pullman, and excess baggage fares, should be denied.

An order in accord with these views will be entered.

ORDER

At a general session of the Public Service Commission of Nevada held at its offices in Carson City, Nevada, September 17, 1920.

Present—Chairman J. F. Shaughnessy, Commissioner W. H. Simmons, Commissioner J. G. Scrugham, and Secretary Benson Wright.

Pursuant to the opinion in the above-entitled proceeding, which is hereby referred to and made a part hereof, it is

ORDERED, That the applications of the carriers in this proceeding for authority to horizontally increase freight and milk rates, and passenger, Pullman, and excess baggage fares covering intrastate business within Nevada be, and the same are, hereby denied.

[SEAL]

J. F. SHAUGHNESSY, *Chairman.*

W. H. SIMMONS, *Commissioner.*

J. G. SCRUGHAM, *Commissioner.*

Attest: BENSON WRIGHT, *Secretary.*

Dated September 17, 1920.



CARSON CITY, NEVADA

STATE PRINTING OFFICE : : JOE FARNSWORTH, SUPERINTENDENT

1920

**THE LAW REQUIRES THIS TO BE
POSTED IN EVERY SCHOOLROOM**

STATE OF NEVADA DEPARTMENT OF EDUCATION

Text- and Supplementary Books

**ADOPTED BY STATE TEXT-BOOK COMMISSION, JUNE, 1919, AND JUNE, 1920
(See 1919 List, also)**

A brief statement in regard to the adoptions made by the Nevada Text-Book Commission, June, 1919, and June, 1920, is given to assist teachers in the selection of books where there are optional adoptions.

No Bookkeeping text was adopted, as under the State Text-Book Commission law there is no authorization for the adoption of a text in this subject. However, since the School Code requires work in Business Forms and Elements of Bookkeeping, and the teachers are therefore required to give this work, Schoch & Gross's "Elements of Business" (or some similar text) is to be furnished the teacher by each district as a basis for the work in the eighth grade. It would be well to have pupils supplied with the text, also.

The Tarr-McMurry "New Geographies" are the adoptions for the coming year (1920-1921) on account of the unsettled conditions due to the war and in order to get the 1920 census returns.

In choice of the language series the State Text-Book Commission selected "Live Language Lessons" and "Oral and Written English" as the two best fitted for the needs of the schools in Nevada, with this expression of opinion: "It being the sense of the majority of the Commission that the 'Live Language Lessons' seem better fitted for the use of the rural schools." Any district has a free choice as to which of the two series is to be purchased for use in that school. This expression of judgment was made simply to aid rural schools in selecting a series.

The spelling texts offer a choice between the Pearson and Suzzallo "Essentials of Spelling" and "The New World Speller," both of which contain far less words than the "Hicks Champion Speller," which has been used for the past eight years. The "Hicks Champion Speller" contains about seven thousand words, "The New World Speller" about five thousand words, and "Pearson and Suzzallo" a little over three thousand. The latter is a one-book speller, to be used from the second to eighth grade, while "The New World Speller" is a three-book text, which does not reduce the word list as radically as the other text.

In making the adoption of method readers the State Text-Book Commission endeavored to offer a choice of methods without giving such a wide choice as would interfere with sound progress in the State. Similar action by other States offered a precedent that seemed worth considering. The "Beacon

Method" is retained so that those who have obtained satisfactory results in its use may continue this system. "The Natural Method Reader" uses the "story-approach" or analytic method, with the phonic system built on the family groups, as in the Gordon system used for the eight years previous to the adoption of the Beacon method.

PRICE-LIST OF TEXT-BOOKS

Gray, Reid, Wright Company, Reno, Nevada, is the State Depository

Titles of books, and addresses of dealers	Price to school districts f. o. b.			Exch. price	
	Boston, Chicago, or New York	Reno	San Francisco	Old, with school districts	New, with school district or dealer
ARITHMETIC					
Wentworth-Smith: Essentials of Arithmetic—					
Primary Book—Grades 3, 4	\$0.31	\$0.38	\$0.34		
Intermediate Book—Grades 5, 6	.35	.45	.38		
Advanced Book—Grades 7, 8	.39	.47	.42		
Ginn & Co., 20 Second St., San Francisco					
For Supplementary Material, see Course of Study.					
Courtis: Standard Practice Tests—					
Cabinet No. 1	4.60	6.98			
Cabinet No. 2	4.00	4.20			
Teacher's Manual	.85	.87			
Student's Record and Practice Pad	.12	.13			
World Book Company, Yonkers, N. Y.					
Felter: One Thousand Problems and Exercises in Arithmetic (see Course of Study)—					
Fifth Year	.13	.14			
Sixth Year	.13	.14			
Seventh Year	.13	.14			
Eighth Year	.13	.14			
Silver, Burdett & Co., 565 Market St., San Francisco					
BOOKKEEPING (See Course of Study)					
Schoch and Gross: Elements of Business (or similar text) in hands of teacher	.66	.80	.71		
American Book Company, 565 Market St., San Francisco					
DICTIONARIES					
Webster's Shorter School Dictionary	.54	.65	.58		
Webster's Elementary School Dictionary	.75	.90	.80		
Webster's Secondary School Dictionary	1.35	1.62	1.44		
American Book Company, 565 Market St., San Francisco					
DRAWING					
Industrial Art Text-Books (Regular Edition)—					
Part I	.22	.27			
Part II	.22	.27			
Part III	.22	.27			
Part IV	.22	.27			
Part V	.26	.32			
Part VI	.26	.32			
Part VII	.26	.32			
Part VIII	.26	.32			
A. S. Barnes Company, 1922 Calumet Ave., Chicago, Ill.					
For Supplementary Books, see Course of Study					
GEOGRAPHY					
Fairbanks: Home Geography for Primary Grades	.45	.54	.48		
Educational Publishing Co., 717 Market St., San Francisco					
Tarr & McMurry: New Geographies—					
First Book	.84	1.00	.90		
Second Book	.93	1.12	1.00		
The Macmillan Co., 563-571 Market St., San Francisco					

PRICE-LIST OF TEXT-BOOKS—(continued)

Titles of books, and addresses of dealers	Price to school districts f. o. b.			Exch. price	
	Boston, Chicago, or New York	Reno	San Francisco	Old, with school district	New, with school district or dealers
GRAMMAR —*Cobasal or Optional Adoption					
Either— (See Course of Study)					
Driggs: Live Language Lessons—					
First Book—Grades 3, 4	.39	.47		.44	Even
Second Book—Grades 5, 6	.39	.47		.44	Even
Third Book—Grades 7, 8	.48	.58		.55	Even
Or— <i>University Publishing Company, Chicago, Ill.</i>					
Jeschke: Beginner's Book in Language—Grade 3	.36	.43	.38	.37	
Potter, Jeschke & Gillett: Oral and Written English—					
Book One—Grades 4, 5, 6	.42	.50	.45	.44	
Book Two—Grades 7, 8	.54	.65	.58	.56	
<i>Ginn & Co., 20 Second St., San Francisco</i>					
HISTORY (See Course of Study)					
Gordy: Stories of Early American History—Grade 4	.54	.64	.58	.58	
Gordy: Stories of Later American History—Grade 5	.63	.75	.67	.67	
<i>Charles Scribner's Sons, 597-599 Fifth Ave., New York</i>					
Mace-Tanner: Story of Old Europe and Young America—Grade 6	.98	1.12½	1.12½	.98	Even
<i>Rand, McNally & Co., Chicago, Ill.</i>					
Guitteau: Our United States, A History—Grades 7, 8	1.20	1.27		1.12	Even
<i>Silver, Burdett & Co., 565 Market St., San Francisco</i>					
MUSIC					
For Rural Schools—					
Meyers: School Music Reader	.45	.54	.48	.51	Even
For Town and City Schools. *Cobasal.					
Either—					
Progressive Music Series—					
Book One	.27	.29			
Book Two	.30	.32			
Book Three	.33	.35			
Book Four	.48	.53			
Teacher's Manual, Vol. I	.90	.96			
Teacher's Manual, Vol. II	.90	.96			
Teacher's Manual, Vol. III	.90	.96			
<i>Silver, Burdett & Co., 565 Market St., San Francisco</i>					
Or—					
New Educational Music Course—					
First Reader	.27	.32	.29	.28	
Second Reader	.27	.32	.29	.28	
Third Reader	.33	.40	.35	.34	
Fourth Reader	.36	.43	.38	.37	
Fifth Reader	.45	.54	.48	.47	
<i>Ginn & Co., 20 Second St., San Francisco</i>					
PHYSIOLOGY —*Cobasal or Optional Adoption					
Richie-Caldwell: New Primer of Hygiene (To be purchased by districts for all elementary teachers in lower grades)	.39	.468			
Either—					
Richie: Sanitation and Physiology (for Eighth Grade)	.75	.90			
<i>World Book Company, Yonkers, N. Y.</i>					
Or—					
Jewett: The Body and Its Defenses (for Eighth Grade)	.57	.68	.61	.59	
<i>Ginn & Co., 20 Second St., San Francisco</i>					
NOTE—The "New Sanitation and Physiology" should be secured where texts are being purchased for an entire class. But where "Sanitation and Physiology" (the old edition) is in use and a few additional copies are needed, "Sanitation and Physiology" should be purchased and not the New Edition, as otherwise two different editions would be in use in the same class.					

*See explanatory note on page 5.

PRICE-LIST OF TEXT-BOOKS—Continued

Titles of books, and addresses of dealers	Price to school districts f. o. b.			Exch. price	
	Boston, Chicago, or New York	Reno	San Francisco	Old, with school district	New, with school district or dealer
READING—Optional Adoption					
(a) Method Readers—					
Either—					
Beacon Primer .....	.27	.32	.29		
Beacon First Reader .....	.27	.32	.29		
Beacon Second Reader .....	.31	.38	.34		
Beacon Third Reader .....	.42	.50	.45		
Beacon Fourth Reader .....	.54	.65	.58	.55	
Beacon Fifth Reader .....	.54	.66	.58	.56	
Beacon Phonetic Chart, Beacon Reading Chart and Holder (two charts and holder in one package each of Letter and Perception Cards)	4.50	5.40	4.80		
NOTE—The Phonetic Chart, the Reading Chart, Holder, and Cards may be bought separately at proportionate prices. See 1917 Course of Study.					
Or— <i>Ginn & Co., 20 Second St., San Francisco</i>					
Natural Method Readers:					
Primer .....	.24	.29	.26	.25	
First Reader .....	.28	.33	.30	.29	
Second Reader .....	.33	.40	.36	.34	
Third Reader .....	.38	.45	.40	.39	
Fourth Reader .....	.42	.50	.45	.44	
Fifth Reader .....	.48	.58	.51	.50	
Teacher's Manual .....	.42	.50	.45		
Word Cards for Primer .....	.84	1.01	.90		
Phonic Cards for Primer .....	.75	.90	.80		
Phonic Cards for First Reader .....	.72	.87	.77		
Phonic Cards for Second Reader .....	.84	1.01	.90		
Rhyme Cards .....	.45	.54	.48		
Sentence Cards	1.13	1.35	1.20		
Phrase Cards .....	.56	.68	.60		
<i>Charles Scribner's Sons, 597-599 Fifth Ave., New York</i>					
(b) Content Readers (one or more of the following series)—					
Edson-Laing Readers:					
Book I .....		.49		.32	
Book II .....		.44		.35	
Book III .....		.48		.39	
Book IV .....		.56		.45	
Book V .....		.68		.55	
<i>Benj. H. Sanborn & Co., 623 S. Wabash Ave., Chicago, Ill.</i>					
Holton-Curry Readers:					
First Reader .....	.30	.36	.34	.34	Even
Second Reader .....	.33	.40	.38	.38	Even
Third Reader .....	.37	.45	.42	.42	Even
Fourth Reader .....	.41	.49	.46	.46	Even
Fifth Reader .....	.45	.54	.51	.51	Even
Curry: Literary Readings (for Seventh and Eighth Grades) .....	.60	.72	.68	.68	Even
<i>Rand, McNally & Co., Chicago, Ill.</i>					
Searson-Martin-Tinley: Studies in Reading—					
Fifth Grade Reader .....	.42	.50		.48	Even
Sixth Grade Reader .....	.42	.50		.48	Even
Seventh Grade Reader .....	.45	.54		.51	Even
Eighth Grade Reader .....	.48	.58		.55	Even
<i>University Publishing Co., Chicago, Ill.</i>					
Standard Classic Readers—					
Fifth Year .....	.34	.41	.36	.39	Even
Sixth Year .....	.38	.45	.40	.42	Even
Seventh Year .....	.45	.54	.48	.51	Even
Eighth Year .....	.45	.54	.48	.51	Even
<i>Educational Publishing Co., 717 Market St., San Francisco</i>					
Or—					
Either of the series of Method Readers above not used as Basal Method readers may be used as Content readers.					

See explanatory note, page 5.

PRICE-LIST OF TEXT-BOOKS—Continued

Titles of books, and addresses of dealers	Price to school districts f. o. b.			Exch. price	
	Boston, Chicago, or New York	Reno	San Francisco	Old, with school district	New, with school district or dealers
SPELLING—*Cobasal or Optional Adoption					
Either—					
Pearson-Suzzallo: <i>Essentials of Spelling, Complete</i>.....	.80	.36	.32	.34	Even
<i>American Book Co., 565 Market St., San Francisco</i>					
Or—					
Wohlfarth-Rogers: <i>New World Speller—</i>					
First Book—Grades 1, 2, 3.....	.30	.36		.28	.34
Second Book—Grades 4, 5, 6.....	.30	.36		.28	.34
Third Book—Grades 7, 8.....	.30	.36		.28	.34
Teacher's Manual.....	.12	.144			
<i>World Book Co., Yonkers, New York</i>					
WRITING					
Palmer: <i>Writing Lessons for Primary Grades</i>.....	.10	.12			
Palmer: <i>Method of Business Writing</i>.....	.16	.19			
<i>A. N. Palmer Company, Cedar Rapids, Iowa</i>					

* A Cobasal or Optional adoption gives a choice of one of two books adopted, as in Physiology, or one of two series of books, as in the case of the *Beacon* and *Natural Method Readers*. Only one book, or only one series of books, is required, and an option or choice as to the one preferred is thus given.

SUPPLEMENTARY AND LIBRARY BOOKS

See 1919 Text and Supplementary List for names and addresses of book companies.

GRADE I

Cherry-Tree Children, by Blaisdell—L. B. & Co., 52c.

Boy Blue and His Friends, by Blaisdell—L. B. & Co., 60c.

Pretty Polly Flinders, by Blaisdell—L. B. & Co., 60c.

Bunny Rabbit's Diary, by Blaisdell—L. B. & Co., 60c.

GRADE II

Stories from a Mouse Hole, by Dyer—L. B. & Co., 70c.

The Outdoor Book, by Meyer—L. B. & Co., 60c.

Tommy Tinker's Book, by Blaisdell—L. B. & Co., 60c.

Twilight Town, by Blaisdell—L. B. & Co., 60c.

Arabella and Araminta—T. B. & Co.

GRADE III

New Barnes Reader, Book III—B. Co.

Glinda of Oz—Reilly & Lee Co., \$2.10.

Play Awhile, by Doheny—L. B. & Co., 70c.

In the Green Fields, by Meyer—L. B. & Co., 68c.

Merry Animal Tales, by Bigham—L. B. & Co., 67c.

GRADE IV

Old Mother West Wind, by Burgess—L. B. & Co., 67c.

Mother West Wind's Animal Friends—L. B. & Co., 67c.

Mother West Wind's Children, by Burgess—L. B. & Co., 67c.

Firebrands, by Martin & Davis—L. B. & Co., 70c.

- Grasshopper Green's Garden, by Schwartz—L. B. & Co., 68c.
 Pioneers of America, by Blaisdell & Ball—L. B. & Co., 67c.
 The White Indian Boy, by Wilson & Driggs—W. B. Co.
 Exmoor Star, Autobiography of a Pony, by A. E. Bonser—R. Co.
 Told in a Little Boy's Pocket—B. Co.
 Fairy Stories My Children Love Best of All, by Shimer—Lloyd Adams Noble
 Pub. Co., \$1.25.
 A Central American Journey, by Babson—W. B. Co.
 American History for Little Folks, by Blaisdell & Ball—L. B. & Co., 60c.
 Conservation Reader, by Fairbanks—W. B. Co., \$1.20.

GRADE V

- Little People Everywhere—L. B. & Co., 60c.
 Ume San in Japan.
 Gerda in Sweden.
 Donald in Scotland.
 Josefa in Spain.
 Hassan in Egypt.
 Boris in Russia.
 Chandra in India.
 Betty in Canada.
 Manuel in Mexico.
 Marta in Holland.
 The Boy's Parkman, by Hasbrouck—L. B. & Co., 75c.
 Indian Child Life, by Eastman—L. B. & Co., 67c.

GRADE VI

- Men of Old Greece, by Jennie Hall—L. B. & Co., 70c.
 Louisa Alcott Story-Book, by Coe—L. B. & Co., 67c.
 How the Present Came from the Past, by Wells—M.
 World-Famous Stories in Historic Settings, by Best.
 Merrie England.
 Glorious Greece and Imperial Rome.
 Egypt and Her Neighbors.
 Western Europe.

GRADE VII

- Rivals for America, by Parkman—L. B. & Co., 75c.

GRADE VIII

- Learning to Write, by R. L. Stevenson—S. & S.
New Civic and Patriotic Books—
 The American's Creed and Its Meaning—Doubleday, Page & Co.
Physiology and Hygiene—
 Emerson & Betts—Robbs-Merrill.
 Physiology and Hygiene.
 Hygiene and Health.
 Danger Signals for Teachers—Forbes & Co.



CARSON CITY, NEVADA

STATE PRINTING OFFICE : : JOE FARNSWORTH, SUPERINTENDENT

1920

STATE OF NEVADA

OFFICIAL RETURNS

OF THE

Primary Election of 1920

Compiled by

GEORGE BRODIGAN

Secretary of State of the State of Nevada



CARSON CITY, NEVADA

STATE PRINTING OFFICE : : : JOE FARNSWORTH, SUPERINTENDENT

1920

OFFICIAL RETURNS OF PRIMARY ELECTION HELD SEPTEMBER 7, 1920

County, and Precinct	DEMOCRAT					REPUBLICAN										
	Presidential Electors		Representative in Congress			Presidential Electors					United States Senator					
														Rep. in Congress		
CHURCHILL COUNTY	Forman, William.....	10	11	7	9	10	13	11	13	8	7	10	5	8	156	117
	George, Sarah J.....	9	7	32	17	13	20	22	19	10	10	6	5	13	9	
	Hesson, Robert W.....	9	7	32	17	20	22	19	23	10	9	26	15	15	7	
	McGovern, Chas. M.....	6	5	21	19	22	19	23	8	9	9	23	10	13	0	
	Evans, Charles R.....	9	6	19	19	19	23	24	20	9	9	17	6	14	0	
	Pratt, Walter E.....	1	3	5	4	9	24	20	23	11	9	9	8	17	0	
	Stoddard, Richard C.....	4	13	15	12	9	23	24	20	11	9	17	6	14	0	
	Boyd, Miss Delle B.....	13	20	22	9	10	18	9	10	7	7	15	5	9	0	
	Bracken, Walter R.....	11	20	22	6	16	16	16	10	7	7	15	5	9	0	
	Campbell, Louis G.....	13	20	22	7	4	7	7	10	7	7	15	5	9	0	
	Crumley, J. G.....	8	10	10	9	9	9	9	9	9	9	9	3	3	0	
	Gelder, Harriet S.....	7	10	10	9	9	9	9	9	9	9	9	3	3	0	
	Morehouse, H. V.....	10	6	26	15	23	8	17	6	15	5	9	0	0	0	
	Whiteley, George A.....	5	10	15	15	23	8	17	6	15	5	9	0	0	0	
	Adams, Brewster	8	13	15	15	23	8	17	6	15	5	9	0	0	0	
	Miller, A. Grant.....	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
	Oddie, Tasker L.....	13	22	27	1	0	0	0	0	0	0	0	0	0	0	
Summerfield, Sardis..	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
Wharton, Charles E.....	1	0	0	0	0	0	0	0	0	0	0	0	0	0		
Arentz, Samuel S.....	8	19	33	11	20	26	14	7	14	14	14	14	14	14		
McNeill, William T.....	12	15	11	20	26	14	7	14	14	14	14	14	14	14		
Totals for Churchill County.....	176	147	175	122	139	33	57	160	151	153	87	63	116	67	104	117

CHURCHILL COUNTY

New River No. 1.....	10
New River No. 2.....	11
New River No. 3.....	28
New River No. 4.....	24
New River No. 5.....	30
West Side.....	9
St. Clair.....	33
Harmon.....	7
Stillwater.....	12
Hazen.....	7
White Rock.....	0
Dixie.....	5

CLARK COUNTY														
Nelson	2	2	3	1	1	0	4	8	5	4	1	1	4	1
Searchlight	20	19	26	34	5	2	9	7	8	3	2	2	3	2
Orcutt	5	5	4	4	1	0	4	4	3	1	1	1	1	1
Goodsprings	24	18	13	8	19	2	17	23	13	5	7	8	6	4
Arden	6	2	4	5	1	0	0	0	0	0	0	0	0	0
Las Vegas No. 1	73	72	112	87	31	11	43	82	34	27	11	31	33	26
Las Vegas No. 2	77	59	116	97	25	11	40	74	37	14	6	30	20	39
Mosopa	8	5	6	6	3	0	7	9	7	2	2	1	3	6
Logandale	4	2	5	3	1	1	2	2	1	1	1	1	0	1
Overton	25	31	26	28	8	1	12	14	10	4	4	4	5	10
St. Thomas	12	10	9	11	4	0	3	8	5	1	1	3	3	5
Bunkerville	15	12	13	12	6	1	8	6	6	2	4	1	4	7
Mesquite	17	14	15	21	2	3	5	0	4	4	0	1	3	3
Totals for Clark County	298	277	333	351	107	82	153	247	134	68	40	88	83	95
DOUGLAS COUNTY														
Fast Fork	49	32	46	42	9	11	51	38	57	21	19	52	32	16
Genoa	15	10	16	6	12	1	18	16	25	9	5	14	13	7
Jacks Valley	8	5	5	0	4	2	1	1	2	3	1	3	1	1
Minden	13	11	15	7	8	0	23	22	23	12	14	23	17	13
Mottsville	2	2	2	0	1	0	7	5	9	5	0	8	8	2
Totals for Douglas County	82	60	84	55	25	22	100	82	116	50	39	100	71	38

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OFFICIAL RETURNS OF PRIMARY ELECTION HELD SEPTEMBER 7, 1920—Continued

County, and Precinct	DEMOCRAT				REPUBLICAN																
	Presidential Electors		Representative in Congress		Presidential Electors						United States Senator					Rep. in Congress					
	Forman, William	George, Sarah J.	Hesson, Robert W.	McGovern, Ohas. M.	Evans, Charles R.	Pratt, Walter E.	Stoddard, Richard C.	Boyd, Miss Delle B.	Bracken, Walter R.	Campbell, Louis G.	Crumley, J. G.	Gelder, Harriet S.	Morehouse, H. V.	Whiteley, George A.	Adams, Brewster	Miller, A. Grant	Oddie, Tasker L.	Summerfield, Sardis	Wharton, Charles E.	Arentz, Samuel S.	McNejl, William T.
HUMBOLDT COUNTY	11	9	4	9	6	0	5	1	3	2	0	0	2	2	0	0	4	0	0	3	1
	5	5	2	3	4	1	0	0	0	1	1	1	1	1	0	0	1	0	0	1	0
	6	5	7	4	4	0	1	6	1	1	2	1	1	1	0	0	2	0	0	0	2
	3	3	3	0	2	0	8	6	2	6	2	1	4	0	1	0	1	0	0	0	1
	23	15	26	21	10	12	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	10	11	12	7	12	1	1	4	2	5	1	4	4	0	2	0	1	1	1	1	1
	2	2	1	1	3	0	1	2	0	1	2	4	0	0	0	0	0	0	0	0	0
	36	25	33	17	30	8	5	10	1	14	3	2	4	7	0	0	7	0	0	0	0
	1	1	1	0	9	3	0	11	4	11	6	0	0	2	1	0	3	2	1	2	1
	13	10	11	6	9	3	2	21	1	4	0	0	0	4	0	0	0	0	0	0	0
	3	3	3	1	2	0	0	5	2	4	3	2	0	2	1	0	4	0	0	2	1
	144	137	114	115	131	36	81	20	14	25	13	16	10	25	10	1	21	0	2	28	6
	171	182	152	116	147	43	98	12	17	26	5	5	11	4	5	5	15	1	1	15	10
	0	0	0	0	0	0	0	5	3	4	0	2	1	0	1	1	3	0	0	4	1
Totals for Humboldt County	432	364	374	303	365	106	94	82	53	113	41	33	50	31	23	24	31	9	6	37	50
LANDER COUNTY	9	4	11	8	10	0	3	7	8	9	6	7	14	7	0	13	8	2	0	23	1
	13	10	16	14	11	0	4	3	12	14	6	5	12	10	4	12	6	0	0	13	4
	16	16	24	10	15	6	7	8	11	17	6	10	10	8	1	8	10	0	0	18	6
	20	16	23	15	12	11	4	10	10	27	2	1	13	3	10	8	20	0	0	19	14
	10	10	5	7	12	0	1	3	4	7	2	1	3	2	1	6	0	0	1	12	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

OFFICIAL RETURNS OF PRIMARY ELECTION HELD SEPTEMBER 7, 1920—Continued

County, and Precinct	DEMOCRAT										REPUBLICAN										
	Presidential Electors					Representative in Congress					Presidential Electors					United States Senator					Rep. in Congress
	Forman, William.....	George, Sarah J.....	Hesson, Robert W.....	McGovern, Chas. M.....	Evans, Charles R.....	Pratt, Walter E.....	Stoddard, Richard C.....	Boyd, Miss Delle B.....	Bracken, Walter R.....	Campbell, Louis G.....	Crumley, J. G.....	Gelder, Harriet S.....	Morehouse, H. V.....	Whiteley, George A.....	Adams, Brewster.....	Miller, A. Grant.....	Oddie, Tasker L.....	Summerfield, Sardis.....	Wharton, Charles E.....	Arentz, Samuel S.....	McNeil, William T.....
MINERAL COUNTY	6	6	5	0	4	0	1	2	2	0	0	1	1	0	0	0	2	0	0	2	1
	4	3	2	3	4	1	0	5	0	0	5	2	5	5	1	3	1	0	0	10	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	20	19	18	11	20	2	12	6	18	11	13	9	2	7	12	6	16	1	0	23	9
	22	15	16	11	10	5	0	6	2	1	4	4	4	3	2	2	3	0	2	8	0
	2	1	2	0	12	0	0	0	13	4	0	0	16	9	0	1	7	0	0	5	1
	16	10	12	9	11	1	4	15	13	17	13	7	13	9	7	10	15	3	3	19	8
	4	2	2	2	3	1	0	3	2	4	2	1	3	1	1	0	2	0	1	4	0
	2	2	2	0	2	0	0	0	0	2	0	2	2	2	1	0	5	1	0	5	1
	3	2	3	3	3	0	2	2	0	4	0	3	2	1	0	0	2	1	0	3	2
	4	2	3	4	0	0	0	5	0	5	0	2	2	2	0	0	5	0	1	4	0
	1	3	1	2	3	0	1	7	7	8	2	3	3	1	0	0	0	0	3	8	3
	3	0	3	0	0	0	0	5	5	4	2	6	6	2	2	2	0	0	1	10	2
	0	0	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0	4	0
	Aurora.....	4	1	4	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals for Mineral County.....	91	67	72	51	74	10	24	92	62	68	50	37	51	36	33	25	81	4	8	102	33
NYE COUNTY	7	4	6	6	6	1	1	4	2	2	4	1	2	8	0	3	3	0	0	2	4
	0	0	0	0	0	0	0	15	0	0	0	6	11	0	1	0	13	0	0	13	0
	10	6	6	7	3	2	1	2	0	11	12	6	0	0	0	10	0	0	1	13	0
	10	7	3	0	0	0	0	0	2	3	0	0	1	0	0	0	2	0	0	2	0
	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

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OFFICIAL RETURNS OF PRIMARY ELECTION HELD SEPTEMBER 7, 1920—Continued

County, and Precinct	DEMOCRAT					REPUBLICAN																
	Presidential Electors		Representative in Congress		Total	Presidential Electors					United States Senator					Rep. in Congress						
	Forman, William.....	George, Sarah J.....	Hesson, Robert W.....	McGovern, Chas. M.....		Evans, Charles R.....	Pratt, Walter E.....	Stoddard, Richard C.....	Boyd, Miss Delle B.....	Bracken, Walter R.....	Campbell, Louis G.....	Crumley, J. G.....	Gelder, Harriet S.....	Morehouse, H. V.....	Whiteley, George A.....		Adams, Brewster.....	Miller, A. Grant.....	Oddie, Tasker L.....	Summerfield, Sardis.....	Wharton, Charles E.....	Arentz, Samuel S.....	McNeil, William T.....
STOREY COUNTY	17	19	17	15	15	5	3	28	19	15	11	16	25	12	9	11	22	2			18	
	22	18	27	17	15	5	6	24	20	27	6	7	22	6	4	5	24	4			11	
	19	18	24	23	16	2	11	27	25	25	14	10	32	17	4	13	24	2			17	
	15	7	11	13	14	0	2	17	17	8	8	7	18	13	11	3	17	1			14	
	2	2	2	0	1	0	1	1	3	2	0	2	3	4	0	1	2	1			2	
Totals for Storey County.....	75	64	51	63	61	12	23	94	57	77	38	42	100	52	28	33	104	10	6	107	59	
WASHOE COUNTY	51	35	51	39	22	3	40	151	68	86	46	23	113	37	83	7	98	4	0	148	35	
	48	37	49	35	24	6	34	129	53	58	37	31	99	28	66	11	66	17	2	102	53	
	43	43	51	31	16	12	28	121	62	63	38	30	123	39	71	21	61	13	8	108	59	
	25	16	24	19	17	6	13	61	43	40	19	13	58	28	58	14	21	2	2	47	41	
	36	30	40	24	16	2	31	104	44	38	27	98	74	29	58	9	64	5	3	79	48	
	40	31	39	23	25	6	31	96	54	51	32	23	79	24	91	9	20	9	0	77	39	
	35	21	35	25	16	6	22	76	25	40	29	16	71	23	66	15	29	7	0	74	36	
	44	36	45	33	19	8	38	79	24	47	24	17	71	23	37	13	47	6	3	73	39	
	35	24	36	30	27	4	21	39	24	64	17	67	71	23	37	33	36	7	5	42	62	
	25	22	33	23	17	7	15	102	49	62	36	22	79	23	63	8	4	11	2	44	42	
	30	27	33	15	20	8	24	110	62	54	37	20	94	37	45	4	61	10	3	57	63	
	45	33	40	32	22	9	81	37	44	45	23	17	58	25	52	6	34	15	8	80	44	
	82	23	27	20	18	10	15	64	35	45	25	11	42	16	34	10	19	8	2	55	32	
	23	23	30	23	15	8	21	43	29	35	20	13	89	20	34	7	14	6	1	38	32	
	25	24	25	25	15	8	14	43	29	35	20	13	10	39	20	34	10	14	6	3	35	32
	17	30	26	19	16	14	14	43	29	35	20	13	10	39	20	34	10	14	6	3	35	32
	66	59	57	53	49	16	20	59	43	47	26	18	23	16	20	5	23	2	1	40	41	
	51		55	43	38	16	21	39	25	31	12	12	23	16	20	5	23	2	1	40	41	

Sparks No. 3	45	44	41	38	35	6	29	53	33	32	17	15	37	15	43	10	17	6	4	30	30
Washoe	14	7	9	10	5	0	9	5	2	4	9	9	9	9	3	0	9	0	0	4	2
Franktown	6	4	5	3	1	0	6	6	12	5	3	8	8	2	2	0	7	2	0	7	2
Huffakers	2	3	1	3	1	1	1	23	12	17	8	8	22	12	8	5	12	12	0	16	18
Vereil	17	14	16	17	6	3	11	23	10	30	19	9	21	21	27	4	10	12	0	23	20
Wadsworth	13	13	13	15	16	1	7	27	10	37	13	9	15	13	9	3	27	4	1	21	21
Gerlach	12	11	12	10	13	1	7	29	14	23	2	9	10	12	8	12	17	0	1	9	24
Pyramid	0	2	2	2	0	1	0	5	2	3	2	1	4	0	0	2	2	0	0	1	7
Salt Marsh	1	1	1	3	0	1	5	5	3	3	7	0	3	0	0	0	4	0	0	0	5
Duck Lake	6	6	3	3	0	1	6	1	2	3	1	0	2	0	2	0	3	0	0	1	1
Bald Mountain	8	5	8	3	4	2	3	3	2	3	0	2	4	0	0	1	3	2	1	1	6
Totals for Washoe County	827	658	813	826	506	153	438	1091	835	1035	574	409	1444	548	1110	292	839	188	51	1301	887
WHITE PINE COUNTY																					
Ely No. 1	92	69	80	66	84	10	49	23	21	18	13	14	18	63	6	25	40	1	4	46	21
Ely No. 2	109	73	114	92	82	20	56	25	19	26	18	19	31	61	15	15	35	5	4	61	9
Ely No. 3	90	58	70	47	56	25	30	34	38	20	15	16	29	60	16	37	27	0	3	50	18
Osoeola	2	1	1	0	2	0	0	1	6	3	1	1	1	2	4	1	0	6	1	2	4
Cherry Creek	5	6	5	0	5	1	0	8	9	5	4	3	4	8	2	2	3	2	0	4	4
Snake Valley	27	19	25	12	27	3	2	3	3	2	4	3	4	6	2	2	6	2	1	6	5
Newark	4	4	5	2	2	0	3	2	2	2	1	3	4	6	1	1	1	0	1	2	3
Preston	9	10	11	7	9	2	2	5	7	5	3	4	2	8	2	1	5	0	0	2	9
Lane City	3	2	3	1	2	1	0	3	2	2	1	3	3	4	0	4	2	0	0	5	2
Hamilton	8	10	12	7	11	2	3	5	7	1	0	2	3	6	2	4	4	0	0	9	0
Lund	12	10	14	7	12	2	2	0	8	7	3	5	4	2	0	7	4	0	0	4	7
U. S. Tungsten	4	6	6	4	6	1	1	1	1	2	1	0	0	0	0	0	2	0	0	0	2
Melvin	4	4	3	1	4	0	0	2	5	4	0	0	0	4	1	0	4	0	0	5	0
Ruth	52	42	44	31	39	18	8	18	17	18	7	7	10	24	10	8	18	1	6	22	12
Ely City	41	26	41	29	36	7	6	40	24	27	18	33	32	61	10	34	38	0	4	56	23
Muncy	2	1	2	1	1	1	0	4	9	8	2	6	4	10	1	7	5	2	0	6	9
Smelter	111	81	94	66	91	24	15	122	98	115	60	69	74	143	44	137	79	8	11	123	116
Tipplet	1	0	1	1	1	0	0	2	6	4	2	2	5	0	1	4	1	0	0	1	5
Shoshone	0	0	0	0	0	0	0	2	4	4	0	4	2	5	4	3	0	1	0	6	2
Kimberly	13	11	10	10	10	5	1	3	6	3	2	3	8	9	0	6	5	0	0	5	2
Tatt	3	3	6	5	4	4	3	16	11	8	3	0	8	9	4	4	13	0	3	12	9
Ward	1	3	3	2	2	0	1	4	2	2	1	1	1	1	2	2	1	0	0	2	1
Totals for White Pine County	597	442	549	390	486	125	174	833	303	285	155	194	240	485	112	311	299	22	38	429	206

For Assemblymen, Churchill County

Precincts	DEMOCRAT				
	Coverston, G. W.	Gunnow, Clyde	McCall, David	McLean, Edwin P.	Reatr, Fulton H.
New River No. 1	5	10	5	9	3
New River No. 2	5	7	8	6	1
New River No. 3	24	23	13	15	1
New River No. 4	19	21	12	13	3
New River No. 5	24	31	6	18	6
West Side	2	10	8	2	2
St. Clair	21	28	17	15	1
Harmon	8	7	4	2	5
Stillwater	9	10	3	5	1
Hazen	7	6	3	2	3
White Rock	0	0	0	0	1
Dixie	4	1	3	1	1
Totals	128	154	82	88	47

For Assemblymen, Esmeralda County

Precincts	DEMOCRAT					
	Davison, Frank T.	Ernest, Harry	Jordon, J. J.	Mills, Pauline	McQuarrie, H. A.	Walsh, James R.
Goldfield No. 1	49	65	52	49	55	67
Goldfield No. 2	53	109	112	74	123	104
Goldfield No. 3	83	80	66	50	76	103
Lida	0	2	3	2	3	3
Tule Canyon	9	5	4	5	4	4
Sylvania	1	1	1	0	0	0
Fishlake Valley	9	7	7	8	8	4
Blair Junction	1	2	4	5	3	6
Millers	1	4	2	4	1	1
Divide City	2	7	7	8	6	6
Silver Peak	7	11	5	9	1	6
Hornsilver	2	4	2	2	2	3
Totals	247	297	265	216	282	363

Precincts	DEMOCRAT	
	Gentry, Ernest T.	Ernst, Mrs. C. W.
Pioche.....	38	35
Panaca.....	50	15
Caliente.....	30	49
Alamo.....	20	13
Hiko.....	3	13
Groom.....	0	0
Clover Valley.....	3	2
Elgin.....	1	6
Eagle Valley.....	14	6
Spring Valley.....	2	0
Camp Valley.....	4	3
Atlanta.....	5	0
Geyser.....	0	0
Deerlodge.....	0	0
Carp.....	1	2
Comet.....	1	1
Bristol.....	5	2
Totals.....	176	149

For Assemblyman, Mineral County

Precincts	DEMOCRAT	
	Brodigan, T. J.	Stannard, G. B.
Cambridge.....	0	6
Candelaria.....	1	4
Gold Pen.....	0	0
Hawthorne.....	7	18
Luning.....	10	17
Marietta.....	2	0
Mina.....	5	16
Nolan.....	2	2
Schurz.....	0	1
Omco.....	1	1
Queen.....	3	0
Rawhide.....	4	1
Simon.....	0	4
Sweetwater.....	0	0
Aurora.....	2	2
Totals.....	37	72

For State Senator and Assemblymen, Nye County

Precincts	DEMOCRAT										REPUBLICAN		
	State Senator		Assemblymen								State Senator		
	Fitzgerald, D. J.	Lucas, Ben D.	Blake, Charles J.	Dempsey, Ira E.	Finn, Dick	Leary, W. J.	Marsh, W. A.	Mayes, Clarence H.	Piercy, Joe O.	Robb, D. J.	Clark, Stephen S.	Kling, H. D.	Miller, Frank T.
Arrowhead	2	7	3	8	4	5	3	2	2	3	0	1	6
Ash Meadows	0	0	0	0	0	0	0	0	0	0	0	0	0
Beatty	5	6	7	5	2	2	7	4	9	8	2	2	19
Belmont	3	7	5	4	6	5	3	3	4	7	0	1	0
Blue Eagle	0	3	1	1	1	0	3	2	3	2	1	0	2
Bruner	0	0	0	0	0	0	0	0	0	0	0	0	0
Broken Hills	1	4	3	2	3	1	3	3	2	3	1	2	1
Carrara	0	0	0	0	0	0	0	0	0	0	0	2	5
Currant	2	11	4	3	3	8	9	3	3	8	1	1	2
Duckwater	5	4	4	3	3	3	6	2	3	4	0	3	2
Golden Arrow	0	5	1	0	4	0	0	5	5	5	0	0	0
Grantsville	0	0	0	0	0	0	0	0	0	0	0	0	0
Hot Creek	2	2	3	2	0	2	2	2	3	3	0	3	0
Ione	12	1	7	7	2	2	10	2	5	3	14	1	13
Fahrump	0	2	0	1	1	2	2	0	1	1	2	1	2
Manhattan	22	17	10	7	9	9	31	22	24	24	13	40	23
Nyala	0	1	1	0	1	0	1	0	0	1	0	0	3
Pioneer	0	3	2	3	2	2	2	1	0	1	0	5	0
Smoky Valley	7	0	5	3	0	5	2	4	1	5	0	10	0
Sharp	3	0	0	2	0	1	1	2	1	1	5	0	1
Sunnyside	0	5	4	3	1	3	0	3	1	5	0	0	4
Tonopah No. 1	109	113	116	71	126	66	111	58	122	129	20	57	72
Tonopah No. 2	115	93	114	65	135	54	128	50	113	103	16	53	51
Tonopah No. 3	56	61	30	23	46	36	60	34	75	68	17	30	30
Tonopah No. 4	56	60	54	33	70	28	67	40	86	64	19	36	36
Tonopah No. 5	100	94	94	73	106	59	105	58	130	126	33	52	52
Tybo	4	1	4	2	3	1	3	1	4	2	0	0	0
Round Mountain	22	15	18	10	7	20	22	6	22	25	5	5	16
Bonnie Claire	1	0	1	0	1	0	0	0	1	1	2	1	2
Totals	527	498	491	331	536	314	585	310	621	612	142	309	420

For Assemblyman, Ormsby County

Precincts	DEMOCRAT		
	Kearns, William H.	McCracken, Geo. E.	Wallace, William E.
Precinct No. 1	28	80	51
Precinct No. 2	14	42	33
Precinct No. 3	15	32	33
Totals	57	104	216

For Assemblymen, Washoe County

Precincts	REPUBLICAN									
	Speller, Louis A.....	Morris, J. W.....	Mathews, R. D.....	Mack, Ernest D.....	Hunt, Saddle D.....	Hoyt, John D.....	Heward, Harlan L.....	Franzman, Mary O.....	Addenbrooke, B. R.....	
Reno No. 1.....	109	89	103	99	98	116	111	82	146	
Reno No. 2.....	90	57	95	76	88	70	87	50	119	
Reno No. 3.....	101	70	98	86	88	65	98	67	119	
Reno No. 4.....	41	49	52	48	44	44	44	33	53	
Reno No. 5.....	76	46	77	71	59	59	73	49	102	
Reno No. 6.....	70	56	66	58	53	62	74	36	94	
Reno No. 7.....	60	54	56	56	50	43	61	33	74	
Reno No. 8.....	54	67	53	36	40	51	57	32	68	
Reno No. 9.....	39	64	63	33	36	65	73	23	73	
Reno No. 10.....	61	61	68	77	57	52	68	55	86	
Reno No. 11.....	60	48	72	64	57	48	74	53	94	
Reno No. 12.....	81	50	84	70	52	59	77	46	96	
Reno No. 13.....	46	48	55	33	60	41	61	44	77	
Reno No. 14.....	42	45	43	39	46	39	52	37	68	
Reno No. 15.....	34	27	38	27	28	38	38	26	50	
Reno No. 16.....	27	40	33	32	34	34	39	25	41	
Washoe.....	3	5	3	5	1	2	5	0	3	
Franktown.....	7	6	6	5	2	8	3	2	8	
Huffakers.....	22	14	14	22	15	15	19	14	25	
Verdi.....	21	26	19	34	22	26	24	20	22	
Totals	1043	932	1063	941	909	931	1138	708	1424	

For Assemblymen, Washoe County

Precincts	DEMOCRAT									
	Rosa, Paul L.....	Pencila, Jerome.....	Cross, Archie L.....	Thrum, Jack.....	Began, Ed.....	Raine, J. P.....	Nett, J. S.....	McDonald, Joe.....	MacDonald, E. J.....	Kerwin, R. V.....
Reno No. 1.....	23			32	31	22	10	45	16	34
Reno No. 2.....	19			27	28	23	18	38	19	34
Reno No. 3.....				19	25	21	14	30	18	34
Reno No. 4.....				13	14	11	7	20	12	15
Reno No. 5.....				14	26	19	16	33	16	27
Reno No. 6.....				15	15	24	17	32	15	27
Reno No. 7.....				16	24	14	23	20	12	27
Reno No. 8.....				26	35	24	25	34	17	30
Reno No. 9.....				18	36	15	26	17	12	32
Reno No. 10.....				17	16	17	16	24	16	14
Reno No. 11.....				12	18	8	18	27	17	11
Reno No. 12.....				20	26	26	21	27	16	31
Reno No. 13.....				18	13	13	9	25	21	16
Reno No. 14.....				9	15	15	11	26	12	20
Reno No. 15.....				18	29	16	17	18	9	22
Reno No. 16.....				14	26	19	16	12	15	21
Sparks No. 1.....	23		65							
Sparks No. 2.....	19		43							
Sparks No. 3.....	23		38							
Washoe.....		9					3	5	5	11
Franktown.....		7					1	4	3	5
Huffakers.....							0	0	2	2
Verdi.....				10	13	5	16	9	18	8
Totals	65	39	146	303	416	308	274	449	271	417

For Assemblymen, White Pine County

Precincts	REPUBLICAN			
	Chandler, Chas. S.	Lockhart, James M.	Boyle, William	Warrington, Laird H.
Ely No. 1	58	64	54	14
Ely No. 2	67	60	63	15
Ely No. 3	68	64	55	23
Osceola	6	5	6	1
Cherry Creek	8	9	9	1
Snake Valley	11	13	6	7
Newark	3	5	1	4
Preston	12	10	9	2
Lane City	7	6	2	2
Hamilton	7	9	4	3
Lund	11	11	11	2
U. S. Tungsten	2	1	1	0
Melvin	5	5	2	3
Ruth	27	25	21	14
Ely City	64	64	77	21
Muncy	13	13	12	3
Smelter	169	183	181	113
Tippet	5	6	5	0
Shoshone	7	7	5	1
Kimberly	7	8	5	2
Taft	20	20	14	6
Ward	3	4	4	2
Totals	575	601	547	239

SUMMARY OF PRIMARY ELECTION HELD SEPTEMBER 7, 1920

Offices, and Names of Candidates	Counties																	Plurality or majority
	Churchill	Clark	Douglas	Elko	Eureka	Esmeralda	Humboldt	Lander	Lincoln	Lyon	Mineral	Nye	Ormsby	Pershing	Storey	Washoe	White Pine	
DEMOCRAT	176	298	82	352	33	415	432	95	225	116	91	886	280	127	75	827	597	5107
	147	277	60	311	20	305	364	67	180	87	67	547	186	117	64	658	442	3899
	175	333	84	485	36	349	374	91	215	99	72	696	270	131	81	813	549	4923
	122	351	55	299	19	303	303	59	172	74	51	552	218	108	68	628	380	3777
	139	317	57	291	22	342	365	70	181	71	74	680	194	70	61	506	486	3926
	33	107	25	95	2	123	106	18	95	32	10	132	45	45	12	153	125	1158
	57	32	22	142	13	96	94	24	31	24	24	193	121	61	23	488	174	1619
	160	153	100	232	35	89	82	49	61	144	92	496	156	110	94	1691	333	4077
	151	247	82	209	61	83	58	55	61	111	62	333	122	79	87	835	803	2939
	153	134	116	209	48	113	63	55	61	119	68	327	140	152	77	1035	285	3157
	87	68	50	121	20	63	41	27	18	50	50	481	80	42	38	574	155	1905
	63	40	39	107	29	42	33	31	23	234	37	209	51	42	42	409	194	1625
	116	88	100	173	52	87	50	53	24	113	51	332	174	95	100	1444	240	3292
67	83	71	130	37	35	31	31	23	63	36	227	71	42	52	548	485	2041	
REPUBLICAN	104	26	50	80	18	24	23	18	13	116	33	255	81	60	28	1110	112	2151
	26	107	35	47	44	27	24	48	31	29	25	155	40	9	33	252	311	1243
	150	119	110	265	30	93	81	47	39	181	51	435	172	120	104	830	299	3165
	7	6	13	11	7	7	9	2	4	6	4	17	10	10	10	188	22	333
	9	25	1	12	0	6	6	3	6	8	8	28	2	10	6	51	38	219
	156	150	150	278	59	110	87	74	48	255	102	584	190	130	107	1361	429	4280
	117	95	38	124	35	34	50	32	42	49	33	107	77	50	59	887	266	2194





UNIVERSITY OF NEVADA

28

RENO, NEVADA, 1920

BY-LAWS MARKET DEPARTMENT

COUNTY FARM BUREAU, INCORPORATED

Successful Farming Involves Successful Marketing. The Latter Is Second Only in Importance to Production. The Chief Defect in Our Agricultural Industry Is Inefficient Marketing.

By

CHARLES A. NORCROSS
Director Agricultural Extension

CARSON CITY, NEVADA

STATE PRINTING OFFICE : : : JOE FARNSWORTH, SUPERINTENDENT

1920



FARM BUREAU MARKET DEPARTMENT

Successful farming involves successful marketing. When farm products are scarce, the buyer is at the farmer's door; when plentiful, the farmer is at the buyer's door. The vantage shifts. Prices in the one instance may reach too high a level for dependent industries, and in the other too low a level for the producer, a condition less advantageous to both than more stabilized prices.

Marketing farm products is a matter second only in importance to their production. Moreover, marketing from the community standpoint is a highly specialized business problem. Its reaction on the success of farming is far greater than most people realize.

A successful farmers' marketing association has to deal with three important problems, namely:

First—Ascertaining all available markets, the conditions affecting each, quantitative demand, transportation, prices, etc.;

Second—Surveying local production (supply) in relation to demand and, by recommendation, at least, attempting to regulate production to prevent oversupply of any given product;

Third—Establishing a business reputation such that the name of the association is a guarantee for quality, quantity, and prompt delivery.

THE CALIFORNIA MARKETING ASSOCIATION PLAN

The best examples of cooperative marketing in America are found in California. In nearly all these the absolute pooling of the product by grade and variety is a primary condition of membership. The pool is sold and each grower is given the re-sale value of the pool in the same proportion as his deliveries, less the cost of doing business. Such associations are not for profit; they have no capital in the ordinary sense, and declare no dividends. The base of the association is the contract with the grower who agrees to provide the association with the things to sell.

As a rule, such pooling associations do not own or operate warehouses, elevators, or cold-storage plants. The latter are separate concerns organized for profit. The market association deals with them, may assist in their organization if the need exists, and is in a position more or less to enforce reasonable charges. Experience has shown that marketing and warehousing are safest handled separately.

PROPOSED NEVADA MARKETING ASSOCIATION

While pooling is a condition of membership in almost all the California marketing associations, the proposed plan for Nevada, hereinafter presented, not only leaves pooling of any product a matter for future action and agreement by the "Section" representing it, but even the marketing of any product, in whole or in part, by any member of the association is entirely voluntary. He may do so or may not, as his inclination or interests direct.

which substantially all Nevada farmers might be willing to join, since it involves no obligation in advance, but leaves each member free to determine from time to time how far he wishes to utilize the association in the marketing of his products. On the other hand, it provides an organization thoroughly flexible, which can develop along any lines that experience may prove desirable, and under which, in its evolution, all the things which any other market association does, such as grading, standardizing, pooling, etc., may be done.

Moreover, it provides means for marketing every line of farm products under one organization, while at the same time providing for "Sections," under which the producers of different products are separately enrolled. These sections may organize and take any action, such as grading, standardizing, pooling, etc., that may be mutually agreed upon, such agreement governing the handling of that particular product by the general association.

While, in the form presented, the expenses of the association, including the compensation of the marketing agents, are derived (other than a small income from initiation fees) entirely from commissions on marketing transactions, it is contemplated that eventually, should pooling become general, such commission plan would be abandoned for the California system of returning to members the re-sale value of their pool deliveries, less the cost of doing business. Such change would involve merely a modification of the By-Laws.

POOLING NEVADA FARM PRODUCTS

Pooling of any product and its re-sale through a market association involves the adoption and rigid enforcement of grading regulations. Until producers are prepared to adopt and abide by such regulations, they are not ready for pooling. The reason is obvious. A marketing association can continue to do business only so long as it maintains its reputation for delivering to consumers exactly, in quality and time, what has been represented. American business is conducted on lines of confidence in business integrity. Such integrity is so common that it is presumed, but once lost in trade it is well nigh impossible of recovery.

Customers at a distance will rely upon the representations of a marketing association and expect complete fulfilment. If disappointed, not only is such customer lost but as many others as the knowledge of his unsatisfactory experience reaches. A few such instances will discredit an association, causing the loss of markets which otherwise could have been held.

The principal export crops of Nevada are potatoes, alfalfa hay, and canteloupes. One of the anticipated beneficial results of market associations in Nevada would be their reaction on grading and standardizing the potato crop. The most potent incentive for better seed selection, disease eradication, and proper cultivation, is the essential requirements of market associations that potatoes handled must be graded by variety and size, and be free from disease. On the other hand, such extra attention is compensated for by the better prices and more certain market which the association is able to obtain.

Nevada hay crop, in the principal hay-producing counties, would work to the advantage both of farmers and stockmen, and that its tendency would be toward stabilizing both industries.

In the practical workings of such plan it is conjectured that representatives of the hay pool from each county would meet together and counsel as to supply and demand, markets and prices. Also, that they would meet with representatives of the livestock industry, hear the latter's side of the question, and finally come to some understanding that would be more satisfactory to both than the existing method. By such plan it is believed that both sides would come to possess, through such conferences and price agreements, a working knowledge of their reciprocal dependence, one upon the other, in respect to stabilizing their respective industries, and be governed accordingly.

For example, either of two opposite contingencies may be expected to occur with more or less frequency and to alternate with about equal regularity and effect. One is hay surplus relative to demand (local and export), and the other is hay scarcity relative to demand. In this connection it is to be kept in mind that only in occasional years is there any profitable export market; that the stockman is a consumer of 90 per cent, at least, of the hay marketed, and that the farmer, essentially, is vitally interested in the continuation of this source of demand. Conversely, it is also to be kept in mind that stockmen are vitally interested in the quantity of hay produced, and that anything which tends to discourage hay production, by reducing quantity, must increase the future price of this commodity.

Here we have two opposing conditions which neither party can take advantage of without ultimate loss. If in times of hay scarcity the farmer asks a price beyond the ability of the stockman to pay, the result is excess export of live stock to the stockyards and excess losses from starvation on the range; the inevitable effect of which is to reduce the stockmen's demand for hay, not only for the given year but for a number of years thereafter—until range live stock recovers to normal.

In such instance this occurrence has repeated itself at different times, namely, that farmers have asked a higher price in the fall than many stockmen could afford or were willing to pay; sufficient stock was exported to reduce the demand for hay below the marketable supply, and hay sold later on in the season at a less price than stockmen offered in the fall.

The foregoing is the very logical results of the unorganized marketing of a crop under the given conditions. The farmer failed to profit as well as he might from the hay scarcity, not knowing what price was the maximum he could ask and effect a sale, and the stockman lost out by his inability to buy hay at such price at the time he required it.

Consider, now, the opposite situation, where the hay supply exceeds the apparent demand. Here the stockman has the advantage. Without a hay pool, the farmer may be forced to sell at a price leaving him no profit. If he anticipates the continuation of such low prices another season or longer, he is disposed to plow up his alfalfa and grow some

other crop which promises better returns. With the hay crop pooled, however, the bargaining is collective and prices could not more be forced down to an unprofitable level than they would be advanced to an unsalable level under the first condition mentioned.

DIVISION OF POOL RE-SALE PROCEEDS

This analysis is applied to hay, since it is the crop discussed above. The same general principles, however, govern in respect to other similar commodities.

Without pooling, or at least a market association, and what it connotes (accurate knowledge of supply; the best information obtainable as to demand; on which factors collective prices by grade and quality are fixed by those chosen to represent the pool), each producer markets his own product as best he can and only in rare instances with any dependable knowledge as to what price he should ask. The result is a considerable variation in prices for the same grade of product and difference in dates of sales. One producer speculating on a late market at high prices, may fail to sell at all and carry over his crop or a part of it at a loss; another sells early and finds higher prices prevailing later on. Thus, one farmer may make more and another less on the same product as he happens to dispose of it fortunately or otherwise.

With the crop pooled, however, all of the hay in the pool shares, according to its grade, in the market variations of the units sold. For example, let us suppose that 100,000 tons of marketable hay are pooled in a given county; that the managers of the pool ascertain that 80,000 tons represent the reasonable maximum that can be sold to stockmen for local feeding, leaving 20,000 tons for which an export market must be found; that on September 1, the pool managers announced certain prices for certain grades effective during that month and that under such prices stockmen purchased 50,000 tons. At the end of the period the managers may conclude to increase or reduce prices, effective during October and so on through the season until the demand of the stockmen is supplied. Meanwhile an export market had been found for say 18,000 tons of the surplus, leaving 2,000 tons unsold at the end of the season. This residue may represent the crops of Smith, Jones, and Brown. But, while it is on their farms, it does not belong to them but it is the property of the pool, to be sold whenever opportunity presents.

In the division of the pool, after deducting operating costs, each member, inclusive of Smith, Jones, and Brown, exactly in proportion to his contribution to the pool, shares in the re-sale returns. Also each has a pro-rata interest in the hay left over, returnable when it is finally sold. Thus, every member participates equally in all the marketing fluctuations attending the sale of the entire crop.

Pooling agreements provide for monthly and sometimes semi-monthly distribution of sales receipts, so that each member receives his pro rata without delay as settlements are made.

THE MARKET MANAGER

The success or failure of a market association will depend almost wholly on the competency of the market manager. Salesmanship is a highly specialized and technical business profession—not a job. It is

a calling which demands unqualified honesty; mastery of the details of products and markets; alertness, resourcefulness, decisiveness, and all the other qualities which go to make up a "business live-wire." It is a profession, also, which cannot be mastered in a day or a year. Hence, no great degree of success can be expected in a market association, where an inexperienced market manager has been appointed, until he has had time to learn the business—assuming that he possesses the personal qualifications demanded.

WILL A MARKET ASSOCIATION PAY?

Suppose, in answer to the above, that a community produces 100,000 tons of hay for market. No business corporation in the country, owning commodities of a fraction of the value represented, would overlook for one minute the importance of salesmanship to dispose of it. The corporation would figure that inexperienced haphazard selling might easily make a difference of from 50 cents to \$2, or more, per ton on the lot, as against efficient salesmanship. This difference figures out as a premium of \$50,000 to \$200,000 in favor of good salesmanship. What business corporation would hesitate on paying, say, \$10,000—10 cents per ton average—for salesmanship?

Yet farmers in this State and elsewhere, producing crops, in single communities, valued at from one to several millions of dollars, market it themselves, without any dependable knowledge as to market prices or conditions.

FARM BUREAU MARKET DEPARTMENT

The form of market organization represented by the following proposed By-Laws, Rules and Regulations and form of Market Manager's contract, has been adopted and an organization perfected thereunder in Washoe County. It is believed to be adaptable to the other agricultural counties having Farm Bureau organizations. While under the control, in respect to its By-Laws, of the Board Directors of the County Farm Bureau, Incorporated, and membership is limited to Farm Bureau members, in all other respects it is to be regarded as a separate organization, receiving its charter from the County Farm Bureau, but independent in its functions so long as it acts within such By-Laws.

The proposed plan is not presented as the best type of market organization, since, in the writer's opinion, such an association must involve the pooling of products as in California and other States, and which only a small minority of Nevada farmers would likely favor at this time. On the other hand, the organization is one which farmers may join without incurring any obligation thereby; from which profitable results may be expected, if well managed and loyally supported, and which can be progressively modified as rapidly as its members desire.

**BY - LAWS
MARKET DEPARTMENT**

.....COUNTY FARM BUREAU

ARTICLE I

Name, Authorization and Location

SECTION 1. The name of this association shall be Market Department.....County Farm Bureau, and the same shall be open to membership when its By-Laws have been approved by the Board of Directors of the.....County Farm Bureau, Incorporated. The principal office, or place of business, shall be located in....., at such place as the Board of Trustees may fix.

ARTICLE II

Objects and Purposes

SECTION 1. The objects and purposes of this Department shall be to secure better results in grading, packing, advertising, exchanging and marketing farm products, and better terms in quantity, and cooperative purchases of commodities for its members.

ARTICLE III

Membership

SECTION 1. Membership shall be limited to members of the.....County Farm Bureau, who shall subscribe to the membership application form and shall pay an initiation fee of Five Dollars.

SEC. 2. The form of membership application shall be as follows:

I hereby certify that I am a member of the.....
County Farm Bureau, Incorporated; that I have read or have heard read the By-Laws of the Market Department,
County Farm Bureau and hereby subscribe to the same; agree to be bound by the rules and regulations thereof, and hereby agree to pay into the treasury of such department my initiation fee of five dollars, in cash, or from the proceeds of my first transaction. I certify that I am actively engaged in the production of commodities represented by the respective Sections marked with an X and desire to be enrolled as a member in each such Section.

SEC. 3. The membership may be divided into.....Sections,* known respectively, as the

- (1).....Section
- (2).....Section
- (3).....Section
- (4).....Section
- (5).....Section
- (6).....Section

A member may be enrolled in as many of the above sections as may represent the lines of business in which he is actively engaged. Each such section may organize by the election of officers necessary for its purposes and may take such action, not in conflict with these By-Laws, as may promote the interest of its members.

*In Washoe County seven Sections were provided, as follows: (1) Dairy Products; (2) Live stock; (3) Fruit and Truck Gardeners; (4) Potato Growers; (5) Hay; (6) Grain, and (7) Poultry.

ARTICLE IV

Officers and Board of Trustees

SECTION 1. The government of this Department shall be vested in a Board of.....Trustees, who shall be elected, one trustee from and representing each Section, at the regular annual meeting and who shall serve for a period of one year, or until their respective successors are elected.

SEC. 2. The Board of Trustees, from their own membership, shall choose a President, Vice-President, and Secretary-Treasurer, who shall perform such duties as usually devolve upon such officers. The Board shall adopt and provide the forms, method of keeping records and reports of all transactions of the Department; control and supervise its affairs; fix the commissions to be charged for the marketing and the purchasing of the different kinds of commodities handled; make rules and regulations, and perform such other duties as hereinafter prescribed, or necessary to the success of the Department.

SEC. 3. The Board of Trustees shall elect and enter into contract with a duly qualified person, to be known as Market Manager, who shall be the agent of the Department in all market transactions. With the consent of the Board of Trustees, the Market Manager may appoint one or more assistants, whose authority and duties and share of commissions shall be prescribed in writing, approved by the Board of Trustees and the Market Manager.

SEC. 4. No appointment of Market Manager shall be effective until a written contract shall have been entered into between the Board of Trustees and such Market Manager, defining his authority, powers and duties as the agent of the Department; specifying the commissions to be charged in all authorized market transactions; the division thereof between the Department and the Market Manager and such other matters as in the judgment of the Board of Trustees should be embodied in such contract; and such Market Manager has given bond for the faithful performance of his duties in a sum of not less than Five Thousand Dollars, approved by the Board of Trustees.

SEC. 5. The Market Manager shall be charged with the making and keeping of full and complete written records of all transactions, in such manner as prescribed by the Board of Trustees, and shall monthly make a summarized report of the same in duplicate, which shall be audited and approved by the Board of Trustees, one copy of which shall be retained in the permanent files of the Department, and one copy transmitted to the Board of Directors of the Washoe County Farm Bureau, Incorporated.

ARTICLE V

SECTION 1. The Board of Trustees shall designate some bank in..... as the depository of all moneys received. Such moneys shall be carried in three funds respectively, (A) Market Department Sales Fund, (B) Market Department Operating Fund, and (C) Market Department Purchasing Fund.

SEC. 2. There shall be deposited in the Market Department Sales Fund all receipts from the sales of commodities for members and which fund shall be subject to check drawn by the Market Manager and countersigned by the Secretary-Treasurer (a) for the balance due to the vendor on each sale, after deducting the commission; (b) for six-sevenths of the commission on each sale, to the Market Manager; and (c) for one-seventh of the commission thereon in favor of the Market Department Operating Fund, and shall not be drawn upon otherwise; provided, that where the initiation fee of the vendor is to be paid from his first transaction, the amount thereof shall be added to the amount specified in (c) and deducted from (a).

SEC. 3. There shall be deposited in the Market Department Operating Fund all moneys received from initiation fees of members; one-seventh of all commissions; all moneys received from penalties, less any share of the Market Manager therein, as earned commission, under subdivisions (b) and (c) of Section 2, Article VI; moneys received from the sale of property owned by the Department; dues, or donations. Such fund shall be subject to check drawn by the Secretary-Treasurer, countersigned by the President, for rent, clerical help, furniture and fixtures, stationery and all other purposes incident to the conduct and operation of the Department.

SEC. 4. There shall be deposited in the Market Department Purchasing Fund all advances on the purchase price of commodities for members and which fund shall be subject to check by the Market Manager, countersigned by the Secretary-Treasurer for (a) payment on such commodities to the vendor; (b) six-sevenths of the commission thereon to the Market Manager; (c) one-seventh of the commission thereon to the Market Department Operating Fund, and (d) in the event of nonpurchase of the commodity by the Market Manager, the return of such advances to the respective members.

SEC. 5. Exceptions to the foregoing sections under this article shall be "cash in hand" transactions made under conditions wherein it is not feasible, or expedient, due to special conditions, to deposit the proceeds of sales, or advances on purchases in the bank prior to their disbursement by the Market Manager. Such exceptions shall be prescribed by rules and regulations adopted by the Board of Trustees. In all such instances, the Market Manager shall make out full reports of the same on the prescribed forms and deposit in the Market Department Operating Fund the one-seventh share of the commission thereon.

ARTICLE VI

Listing of Commodities and Penalties

SECTION 1. Listing of commodities with the Market Department for marketing on commission shall be voluntary on the part of members, and shall be executed in triplicate on forms provided by the Board of Trustees. Such forms shall provide for a description of the commodity listed, in respect to kind, quality, quantity and location; the time during which the Department shall have the exclusive right of sale; the minimum price for which the same may be sold under such contract; the rate of commission; stipulations as to time, place and condition of delivery to purchaser; f.o.b., or otherwise by the owner; to whom remittance shall be made by purchaser and such other matters as may be pertinent to the transaction.

SEC. 2. Each such executed form shall be in the nature of a contract, assigning to the Department the exclusive right of sale of the described commodity for the period stated, subject to the conditions therein specified as to minimum price, etc., and subject to the following enforceable penalties:

(A) Where the owner disposes of such commodity within the listed period of sale without notice to the Department and written release from the Market Manager:

(a) When the Department, prior to knowledge of such unauthorized sale has not consummated the sale thereof, a penalty of the full commission thereon, payable within ten days after written notice, and on neglect or refusal to pay, expulsion from membership in the Department;

(b) When the Department, prior to knowledge of such unauthorized sale has consummated the sale thereof in accordance with the terms of agreement, and is unable to make delivery, a penalty in a sum equal to

expulsion from membership in the Department.

(B) Refusal on the part of the owner to deliver the commodity in accordance with the terms of the contract, when sale is made by the Department in accordance with such contract, shall subject the owner to the same penalty as provided in (b).

SEC. 3. Such contract, however, shall provide that where the owner of the commodity listed has found a purchaser therefor, prior to its sale by the Department, or has decided not to sell, he shall notify the Market Manager and, on payment of one-half the commission on the minimum price stated in the contract, secure a release thereon.

SEC. 4. Authorization for the purchase of commodities by the Market Department shall be executed in triplicate on forms provided by the Board of Trustees, and shall be in the nature of a contract under which the member, or members, executing the same agree to accept the commodity described therein if purchased by the Department within a prescribed time and within a "stop" price and to pay for the same in the manner prescribed in such contract, inclusive of authorized commission.

SEC. 5. On all purchasing transactions, the Department shall require an advance payment thereon in full of the estimated cost plus commissions, or an advance thereon sufficient to guarantee the Department against loss in the event of the refusal or inability of the purchaser to fulfil the terms of payment. In such latter instance the Market Manager shall sell the commodity on the best terms obtainable; shall utilize any portion of such advance that may be required to balance the transaction, including commission on both purchase and sale, and shall return to the member the balance, if any remaining; provided, that if such advance is insufficient to balance such transaction, including such commissions, claim for the remainder due shall be made against the member, and, if unpaid for ten days after notice, may, in the discretion of the Board of Trustees, be collected by legal proceedings, or the member may be expelled.

ARTICLE VII

Meetings

SECTION 1. The annual meeting of this Department for the election of officers and other business shall be held on the third Saturday in April at 2 p. m. at such place as the Board of Trustees may designate, and the persons so elected shall take office on the first day of May. Special meetings may be called by the President on not less than five days notice mailed to all the members.

SEC. 2. The Board of Trustees shall hold regular monthly meetings, and special meetings at the call of the President.

SEC. 3. Ten per cent of the membership shall constitute a quorum at all membership meetings. A majority shall constitute a quorum at meetings of the Board of Trustees and of committees.

ARTICLE VIII

Amendments

SECTION 1. All amendments, before becoming effective, shall receive the approval of the Board of Directors of the.....County Farm Bureau.

SEC. 2. These by-laws may be amended by a majority vote of those present at any regular meeting of the members, or at a special meeting called for that purpose.

RULES AND REGULATIONS

Following forms of Rules and Regulations are not a part of the By-Laws, but may be adopted by the Board of Trustees, with such modifications as desired. With the By-Laws, they complete the working plan of the organization:

RULES AND REGULATIONS—No. 1

Schedule of Commissions

The following schedule of commissions shall be effective until modified on all market transactions of the Department for its members:

SALES COMMISSIONS		Commission	
Value		Minimum*	Per cent
Less than \$500.....		\$1.05	5 %
\$500 to \$1,000.....		25.00	4 %
\$1,000 to \$2,500.....		40.00	3½%
\$2,500 to \$5,000.....		87.50	3 %
Over \$5,000		150.00	2 %

PURCHASE COMMISSIONS		Commission	
Value		Minimum*	Per cent
Less than \$100.....		\$1.05	5 %
\$100 to \$500.....		5.00	4 %
\$500 to \$1,000.....		20.00	3½%
\$1,000 to \$3,000.....		37.50	3 %
Over \$3,000		90.00	2½%

*Minimum is the least commission chargeable within the group values, same being the maximum charge under the preceding group, except in the first instance, which represents the smallest commission for which the Department will undertake a purchase or sale.

VALUE—Value on which commissions are computed shall be the net proceeds of any sale, aside from Department commission, f. o. b., or delivered to a local purchaser. Same shall not include transportation to, or cartage, or commissions at destination, nor be reduced by cost of delivery f. o. b. shipping point, or to local purchaser by vendor.

CONTINUING SALES transactions, such as securing a market for products to be delivered by the producer throughout a season or extended period—Commission thereon shall be computed on a cumulative value system, as follows: Commission as above on the aggregate sales value the first month. Second month, commission computed on aggregate sales value two months, amount paid first month deducted, balance constituting commission. Succeeding months commissions determined in like manner.

RULES AND REGULATIONS—No. 2

Sales Receipts Paid to Department Only

All sales or commodities for members, shall be in the name of the Market Department,County Farm Bureau, and payment therefor shall be by check payable to such department or cash in hand paid to the Market Manager as its only authorized agent, who shall give receipt for the same, and all checks and moneys so received shall be deposited or handled as prescribed in Article V, By-Laws.

The regular monthly meeting of the Board of Trustees shall be held at the office of the Department at 7:30 p. m., on the fifth day of each month, except when the same falls upon Sunday, or a legal holiday, when it shall be held on the next succeeding day.

RULES AND REGULATIONS—No. 4

Executive Committee

The authority, powers and duties of the Board of Trustees, between regular or special meetings, shall be vested in an Executive Committee consisting of the President, as chairman, and two members of the board appointed by himself.

RULES AND REGULATIONS—No. 5

Finance and Auditing Committee

The Secretary-Treasurer, as chairman, and two members of the Board of Trustees appointed by the President, shall constitute a Finance and Auditing Committee, whose duties shall be to oversee the finances of the department and to audit the monthly summarized report of the Market Manager.

(Form of) MARKET MANAGER'S CONTRACT

THIS AGREEMENT, Made and entered into this.....day of....., 192...., between the MARKET DEPARTMENT,..... COUNTY FARM BUREAU, INCORPORATED, by and through its President and Secretary, duly authorized so to do by resolution of its Board of Trustees duly adopted the.....day of....., 192...., party of the first part, and.....of....., party of the second part, Witnesseth:

(1) That said first party hereby appoints said second party as Market Manager for the MARKET DEPARTMENT,COUNTY FARM BUREAU, pursuant and subject to the provisions of Article IV of its By-Laws and all other of its By-Laws applying, and said party hereby accepts such appointment.

(2) That the term for which said appointment is made shall begin with the date of approval of his bond, as hereinafter provided, and shall continue without definite termination during the period of his satisfactory service to the Board of Trustees of such Department, or the resignation of said party; provided, that sixty days' notice shall be given in all cases of resignation or dismissal not involving charges of malfeasance, or neglect of duty.

(3) Said second party, as Market Manager, shall be the sole and exclusive agent of the first party in all market transactions; he shall maintain his office at the headquarters of the Department as established by the Board of Trustees and shall devote all time needful to the conduct of its affairs.

(4) Said second party shall have sole authority to enter into sales and purchase contracts with members, for and in the name of the first party and as its agent, on written forms provided by said first party, and not otherwise, unless with the consent in advance of its Board of Trustees; he shall enter into no verbal contracts, or contracts wherein the commissions are otherwise than as adopted by said first party, or buying or selling agreements for which he renders no accounting to said first party.

(5) Said second party shall be governed and bound by all provisions of the By-Laws of said first party applying to the administration, conduct and duties of his office and all Rules and Regulations adopted by the Board of Trustees antecedent to his appointment, and the same are hereby made a part of this contract.

(6) Said second party shall be governed by all Rules and Regulations of said first party hereafter adopted; provided, that no modification of the schedule of commissions shall be effective, without his consent, until six months after date of its adoption.

(7) The Market Manager shall be entitled to and receive six-sevenths share of all commissions earned by the Department, in lieu of a salary, which said share shall be paid him, for the transactions of any given month, not later than the 10th day of the succeeding month; provided, that on or before the fifth day of such succeeding month he has completed and submitted the Board of Trustees, for auditing, the summarized report of all transactions of the preceding month, as provided in Section 5 of Article IV, By-Laws of said first party.

(8) Said first party hereby agrees, at its own expense and outlay, to provide said second party with all market contract forms, summarized report forms, record-books, filing systems, typewriter, office equipment, stationery, etc., neces-

janitor service; and to share one-half the cost of clerical help; provided, that the Board of Trustees may by resolution fix a monthly maximum limit to its liability for clerical help; and provided further, that nothing in this section shall obligate said first party for any expenditures in excess of its operating funds, derived from initiation fees and share of commissions.

(9) The provisions of this contract may be altered, amended, or modified at any time by mutual consent of both parties in writing.

(10) This contract shall be effective immediately when said second party has deposited with said first party a good and sufficient bond for the faithful performance of his duties in the sum of.....Dollars. and the same has been approved by its Board of Trustees.

IN WITNESS WHEREOF, The first party has caused its name to be affixed by its duly authorized officers, and said second party has affixed his hand, the day and year first above written.

MARKET DEPARTMENT,

.....COUNTY FARM BUREAU,

By.....,

President,

.....,

Secretary-Treasurer.



STATE OF NEVADA

EDUCATIONAL DIRECTORY

Prepared by
W. J. HUNTING
Superintendent of Public Instruction

December 1, 1920

CARSON CITY, NEVADA
STATE PRINTING OFFICE : : : JOE FARNSWORTH, SUPERINTENDENT
1920

EDUCATIONAL DIRECTORY

Giving the Names and Postoffice Addresses of All School Officers and Teachers in the State of Nevada, December 1, 1920

STATE SCHOOL OFFICERS

SUPERINTENDENT OF PUBLIC INSTRUCTION

W. J. Hunting.....Carson City
Charles Priest, Office Deputy.....Carson City

STATE BOARD OF EDUCATION

Emmet D. Boyle, Governor of Nevada, President.....Carson City
Walter E. Clark, President of the University of Nevada.....Reno
W. J. Hunting, Superintendent of Public Instruction, Secretary.....Carson City

REGENTS OF THE UNIVERSITY OF NEVADA

Hon. B. F. Curler (1923).....Reno
Hon. Walter E. Pratt (1925).....Reno
Hon. Mrs. W. H. Hood (1927).....Reno
Hon. Miles E. North (1929).....Reno
Hon. G. F. Talbot (1931).....Elko

DEPUTY SUPERINTENDENTS OF PUBLIC INSTRUCTION

First Supervision District—Elko County

E. E. Franklin.....Elko

Second Supervision District—Eureka, Lander, and White Pine Counties

George A. Whiteley.....Ely

Third Supervision District—Churchill, Humboldt, and Pershing Counties

Chauncey W. Smith.....Fallon

Fourth Supervision District—Douglas, Lyon, Mineral, Ormsby, Storey, and Washoe Counties

Merrill J. Burr.....Carson City

Fifth Supervision District—Clark, Esmeralda, Lincoln and Nye Counties

T. W. Chapman.....Las Vegas

STATE BOARD FOR VOCATIONAL EDUCATION

W. J. Hunting, Secretary.....Carson City
Homer Derr, State Director and Supervisor Agricultural Education.....Carson City
Sylvia Campiglia, Supervisor Home Economics Education.....Carson City
Benj. H. Morrison, Supervisor Trade and Industrial Education.....Carson City

Walter E. Clark, Ph.D.	President
Robert Lewers	Vice-President, Professor of Elementary and International Law and Municipal Accounting
James Edward Church, Jr., Ph.D.	Professor of Latin Language and Literature
Jeanne Elizabeth Wier, B.A.	Professor of History
Peter Frandsen, M.A.	Professor of Biology
Romanzo Adams, Ph.D.	Professor of Economics and Sociology
Maxwell Adams, Ph.D.	Dean of the College of Arts and Science; Professor of Chemistry
Herbert Wynford Hill, Ph.D.	Professor of the English Language and Literature
Joseph Dieffenbach Layman, B.L.	Librarian
Horace Prentiss Boardman, C.E.	Acting Dean of the College of Engineering; Professor of Civil Engineering
Leon Wilson Hartman, Ph.D.	Professor of Physics
Charles Haseman, Ph.D.	Professor of Mathematics and Mechanics
Francis Church Lincoln, Ph.D.	Director, Mackay School of Mines; Professor of Mining; Director, State Mining Laboratory; Director, Affiliated School of Mines
Frederick Weston Wilson, M.S.	Professor of Animal Husbandry
Reuben Cyril Thompson, M.A.	Professor of Philosophy
J Claude Jones, A.B.	Professor of Geology and Mineralogy; Curator of Mackay Museum
Walter S. Palmer, E.M.	Professor of Metallurgy
Charles Worthen Spencer, Ph.D.	Professor of Political Science
Albert Ellsworth Hill, A.B.	Professor of Rhetoric
James Reed Young, Ph.D.	Professor of Education, and Acting Head of the Department
Colonel John Paul Ryan, U. S. Army.	Professor of Military Science and Tactics
Stanley G. Palmer, M.E.	Professor of Electrical Engineering
Verner E. Scott, B.S.	Professor of Dairying
Abbie Louise Day, B.S.	Professor of Education
John Wm. Hall, M.A.	Professor of Education
Frederick H. Sibley, M.E.	Professor of Mechanical Engineering
Robert Stewart, Ph.D.	Dean of College of Agriculture; Professor of Agronomy
Sarah Louise Lewis, B.S.	Professor of Home Economics
Katherine Lewers	Associate Professor of Freehand Drawing and Art
Katharine Reigelhuth, M.A.	Associate Professor of German, and Head of the Department
Elsie Sameth, B.S.	Associate Professor of Physical Education for Women
Archibald Edwards Turner, B.A.	Associate Professor of Oral English
James Andrew Nyswander, B.S.	Associate Professor of Mathematics
George Wallace Sears, Ph.D.	Associate Professor of Chemistry
Charles Elliott Fleming, B.S.A.	Associate Professor of Animal Husbandry
Frederick L. Bixby, C.E.	Associate Professor of Agronomy
William Ernest Lowther, Ph.D.	Associate Professor of the Romanic Languages and Literatures
Raymond O. Courtright, B.A.	Associate Professor and Head of the Department of Physical Training for Men, and Coach in Athletics
Fred W. Traner, M.A.	Associate Professor of Education
Sanford Crosby Dinsmore, B.S.	Assistant Professor of Agricultural Chemistry; Commissioner Food and Drug Control and Weights and Measures
Albert William Preston	Assistant Professor of Mechanical Engineering
Louise M. Sissa	Registrar
Silas Calvin Feemster, M.A.	Assistant Professor of History
Margaret Elizabeth Mack, M.A.	Dean of Women; Assistant Professor of Biology
Cyrus William Lantz, M.A.	Assistant Professor of Botany
Clifton Roy Hill, C.E.	Assistant Professor of Civil Engineering
George Hardman, M.S.	Assistant Professor of Agronomy
Gilbert Bruce Blair, A.M.	Assistant Professor of Physics
Sidney Warren Wilcox, B.L.	Assistant Professor of Economics and Sociology
Jessie P. Pope, B.S.	Assistant Professor of Home Economics
Layman W. Vawter, D.V.M.	Assistant Professor of Veterinary Science
Charles LeRoy Brown, M.A.	Instructor in Biology

Emma Caroline Drenth..... Instructor in Music, School of Education
 Clarence H. Kent, B.S..... Instructor in Mechanical Engineering
 Charles B. Williams..... Instructor in Physical Education for Men
 Frank Enos Welch, A.M..... Instructor in Department of Romanic Languages

NEVADA AGRICULTURAL EXPERIMENT STATION

STAFF

Samuel B. Doten, M.A..... Director and Entomologist
 Robert Stewart, Ph.D..... Agronomist
 Charles E. Fleming, B.S.A..... Range Management
 Edward Records, V.M.D..... Veterinarian
 Stephen Lockett, V.M.D..... Assistant Veterinarian
 M. E. Miller, B.S..... Chemist
 George Hardman, B.S..... Assistant Agronomist
 Nels F. Peterson, M.A..... Assistant in Range Management
 Maxwell Adams, Ph.D..... Consulting Chemist
 Peter Frandsen, M.A..... Consulting Biologist
 Frederick W. Wilson, M.S..... Consulting Animal Husbandman
 C. W. Lantz, A.M..... Consulting Botanist
 V. E. Scott, B.S..... Consulting Dairy Husbandman
 J. L. Webb..... Bureau of Entomology, U. S. Dept. Agriculture
 Madge Fink..... Secretary to Veterinary Department
 Martha Ryan..... Secretary to Experiment Station

Administrative:

EXTENSION STAFF

Charles A. Norcross, A.B..... Director
 Cecil W. Creel, B.S..... County Agent Leader
 Margaret M. Johnson, M.A..... State Leader of Home Demonstration Leaders
 Merle D. Collins, B.S..... State Club Leader

Specialists:

Stephen Lockett, V.M.D..... Field Agent in Animal Diseases
 Verner E. Scott, B.S..... State Leader in Dairying
 Frederick W. Wilson, M.S..... Specialist in Animal Husbandry
 Mrs. Katherine Smith, A.B..... Clothing Specialist
 Robert Stewart, Ph.D..... Dean of College of Agriculture; Agronomy
 Sarah L. Lewis, B.S..... Professor of Home Economics

County Agricultural Agents:

S. Egbert Merrill, B.S..... Clark County
 Joseph W. Wilson, B.S..... Lyon County
 J. Carlos Lambert, B.S..... Elko County
 Gardner L. Chism, B.S..... White Pine County
 J. L. McGinnis, B.S..... Churchill County
 Earl M. Dobbs, V.M.D..... Clark and Lincoln Counties
 Chester A. Brennen, B.A..... Elko County

Home Demonstration Agents:

Gladys V. Mann..... Elko and White Pine Counties
 Amelia S. Conant..... Churchill County
 Edith G. Knippenberg..... Douglas and Ormsby Counties
 Frances B. Patrick..... Washoe County

County Club Leaders:

Leah Barker, B.S..... Lyon County
 Mildred Meskimons, B.S..... Elko County

PUBLIC SERVICE

State Veterinary Control Service..... Edward Records, V.M.D., Director
 State Hygienic Laboratory..... Gustav F. Ruediger, Director
 Food and Drugs Control and Weights and Measures..... Sanford C. Dinsmore, B.S., Commissioner
 State Analytical Laboratory..... Francis Church Lincoln, Ph.D., Director

Clark County, Las Vegas.....	J. A. Baitt
Douglas County, Gardnerville.....	Benj. M. Aldrich
Elko County, Elko.....	Bertha C. Knemeyer
Elko County, Wells.....	W. J. Freed
Eureka County, Eureka.....	L. A. Hunting
Humboldt County, Winnemucca.....	J. D. Scott
Lincoln County, Panaca.....	H. A. Whiteneck
Lyon County—	
Yerlington, District No. 1.....	J. R. Hill
Dayton, District No. 2.....	Fred M. Gerlach
Smith Valley, District No. 3.....	Edna L. Greenough
Fernley, District No. 4.....	Not yet organized
Mineral County, Hawthorne.....	U. W. Keplinger
Pershing County, Lovelock.....	H. W. Baker
White Pine County, Ely.....	A. S. Kubitz

PRINCIPALS OF DISTRICT HIGH SCHOOLS

Battle Mountain.....	C. F. Waltman
Carson City.....	E. L. McKeown
Educational District No. 1, Clark County—	
Bunkerville.....	L. Raymond Nelson
Overton.....	A. E. Jones
Goldfield.....	A. W. Armitage
Metropolis.....	Margaret Lee
Reno.....	E. O. Vaughan
Sparks.....	C. H. Meeker
Tonopah.....	G. L. Dilworth
Virginia City.....	H. O. Williams

SUPERINTENDENTS AND PRINCIPALS, DISTRICTS OF FIRST CLASS

Carson City.....	E. L. McKeown, City Superintendent
Consolidated B, Fallon.....	L. E. McFadden, City Superintendent
Educational District No. 1, Clark County.....	A. L. Kelley, Overton, Superintendent
Elko Elementary.....	C. L. Neely, City Superintendent
Ely Elementary.....	Mary S. Black, Principal
Goldfield.....	A. W. Armitage, City Superintendent
Las Vegas Elementary.....	J. N. Stewart, Principal
McGill.....	Doty Tipton, Principal
Reno.....	B. D. Billingshurst, City Superintendent
Sparks.....	C. H. Meeker, City Superintendent
Tonopah.....	G. L. Dilworth, City Superintendent
Winnemucca.....	Jessie I. Diamond, Principal

SCHOOLS OF MINES

Tonopah.....	Ellsworth R. Bennett, Principal
Virginia City.....	Dwight T. Smith, Principal

First Supervision District—Elko County

District	Clerk	Teachers	Postoffice	Term month	Sal- ary
Allegheny*	Amos J. Roach	Bernice Rankin	Mountain City	7	8875
Arthur	A. W. Griswold	Cora Younger	Lurline	9	900
Aura	Barney Horn	Laura E. LaPoint	Aura	6	840
Bryan	Mrs. Inez Mackley	Gladys E. Jones	Charleston	7	1050
Bruneau	Robert Prunty	Dormant	Charleston		
Buel	Fred N. Whipple	Ethel J. Clayson	Tecoma	9	1080
Carlin	Mrs. Dora Edwards	Mrs. S. M. Brown, Prin.	Carlin	10	1800
		Annie Laurie Teal	Carlin		1350
		Shirley Worden	Carlin		1350
		Vera L. Webb	Carlin		1350
Clayton	Arthur L. Clayton	(No teacher)	North Fork		
Cobre	L. H. Wirrbaugh	Mrs. Amy H. Parker	Cobre	9	1125
Clover Valley	Mrs. S. J. Weeks	Eva Hale	Wells	9 ¹	1330
Consolidated No. 2	W. G. Parker	V. Nevada Johnson, Prin.	Lamoille	9	1350
		Henrietta R. Haywood	Lamoille		1300
Contact	Laird Wilcox	Mamie Delaplain	Contact	9	990
Cope	Geo. A. Nelson	Echo Bish	Mountain City	8	1000
Deeth	Mrs. A. P. Cannon	E. Gertrude Hunt, Prin.	Deeth	10	1350
		Mrs. R. Krumbein	Deeth		1230
Diamond A.	B. B. Larios	Mrs. Deessie D. Joyal	Jarbridge	6	600
Devil's Gate	Chas. A. Clayton	Margaret Dick	Elko	8	
Elko Grammar School	J. J. Hunter	C. L. Neely, Supt.	Elko	10	3000
		Rose Gardner	Elko		1650
		Nita McCulloch	Elko		1350
		Barbara Higginbotham	Elko		1250
		Alta Byrne	Elko		1250
		Katharyn Cycala	Elko		1400
		Christine Englab	Elko		1400
		Laura Waage	Elko		1350
		Beatrice Misegadis	Elko		1350
		Mary Ellis	Elko		1400
		Hallie M. Day	Elko		1400
		Beatrice Allen	Elko		1350
Elko County High School No. 1	W. R. Englert	W. V. Hollan	Elko		2000
		Bertha C. Knemeyer	Elko	10	3300
		Mrs. Nellie M. Smith	Elko		1900
		George H. Anderson	Elko		1900
		Mrs. Geo. H. Anderson	Elko		500
		Wm. B. Hilbish	Elko		2600
		Bertha Ballou	Elko		1800
		Hazel Woodhull	Elko		2550
		Mrs. Olga S. Young	Elko		1100
		Wm. F. Young	Elko		2650
		Mrs. Mary E. Wolcott	Elko		1800
		Mildred Devereux	Elko		2350
		Gertrude Johnson	Elko		1900
Edgemont	George A. Boyce	(No teacher)	Edgemont		
East Ruby	Peter Bylund	Mrs. Eunice Tuttle	East Ruby	4	440
Harrison	Mrs. Lillian M. Laing	Mrs. Bertha Malcolmson	North Fork	9	900
H. D.	Mrs. Ida A. Austin	Flora H. Melendy	Montello	8	800
Hoover	Mrs. J. W. Jewkes	Jessie Moran	Lurline	8	1000
Hunter	Mrs. Viola Klaner	Lillian Meiss	Elko	8	1000
Huntington	George Mitchell	Mildred Meiss	Jiggs	9	900
I. L.	Mrs. Wm. Hoag	Mrs. J. C. Woodward	Tuscarora	8	960
Island Mountain*	R. Y. Reed	A. E. Porterfield	North Fork	7	700
Jack Creek	Mrs. R. H. Woodward	Millicent M. Foote	Tuscarora	9	945
Jarbridge	Mrs. U. G. Baker	Mrs. Edith L. Ryan	Jarbridge	9	1280
Kleckner	Mrs. Viola Kleckner	(No teacher)	Lee		
Lincoln	Mrs. J. W. Gardner	Ernie Woodhouse	Ruby Valley	10	1000
McCall	Charles Dressi	Mrs. Musa G. Hylton	Elko	8	880
Mahala	C. S. Tremewan	Leona E. Winter	Elko	9	960
Metropolis	L. F. Hatch	Margaret Lee, Principal	Metropolis	9	2200
		E. R. Herring	Metropolis		2000
		G. E. DeMaurier	Metropolis		1500
		Horton Hammond	Metropolis		1400
		Mercy Shawhan	Metropolis		1800
		Katharyn N. Schaeffer	Metropolis		1400
Midas	Mrs. Anna Hargrove	Grace E. Clawson, Prin.	Midas	9	1125
		Leah B. Noble	Midas		1085
Monarch	Brig. Lewis	Gracia Wilmering	Tobar	8	1000
Montello	J. S. Parmley	E. Gertrude Powell, Prin.	Montello	9	1350
		Alva G. Joslin	Montello		1215
		Lucile Hohl	Montello		1215
Mount Valley	Albert Hankins	Sara E. Halpin	Jiggs	8	1085
Myers	Mrs. Cecelia Myers	(No teacher)	Midas		
North Humboldt	G. F. McKnight	Flo Reed	Deeth	9	900
North Ruby	Earl Wright	Alice Hepworth	Arthur	9	1125

*Summer school.

North Star	Mrs. C. H. Black	Clara Wolford	Deeth	9	\$1105
Panama	Mrs. Mabel Rockwell	May Enner	Lamolle	9	
Peko	L. F. Rathfon	Mrs. Cora Grace	Halleck	8	1000
Picallili	Abner O. Wilson	Alice Hitt	San Jacinto	6	800
Pilot Peak	A. J. McQuestion		Montello	8	1000
Pine Mountain	Mrs. Wm. L. Raine	Grace D. Spracklin	Palisade	8	880
Polar Star	S. O. Curtis	Mrs. J. Henry Bishop	Clover City	2	220
Railroad	D. W. Frank	Mrs. G. C. Roberts	Bullion	9	1080
Rowland	John B. Scott	Ada Sharkey	Rowland	9	1080
Ruby Central	I. E. Wines	Estella Wines	Ruby Valley	10	1100
Ruby City	Mrs. Florence Sharp	Agnes Roberts	Lurline	9	990
Ruby Valley	S. T. Wines	Mary B. Rohrer	Ruby Valley	9	990
Ryndon	H. O. Wood	Ada Goodale	Halleck	9	900
Sherman	Fred Walther	Helen K. Taylor	Sherman	9	900
Signal	Mrs. S. Winchell	Louise A. Wolf	Wells	9	900
South Fork	James Holland	Edith Holland	Lee	9	
Springview	Geo. W. Smith	Grace Short	Lurline	9	
Spruce	H. L. Brooks	Esther Schrader	Clover City	7	
Spruce Mountain	Henry Phalen	Mrs. Della O'Donnell	Currie	9	
Starr Valley	Mrs. Hanna Smiley	Mrs. Mark Scott	Starr Valley	9	1170
Success	J. C. Walther	Clara E. Warr	Halleck	9	1080
Swayne	E. A. Schwab	Mary Perkins	Owyhee	9	1125
Tecoma	George W. Martin	Martha Smith	Tecoma	8	910
Tobar	Mrs. E. E. Glazer	Mrs. Leah I. Davis	Tobar	9	1125
Town Creek	Mrs. R. L. Wood	C. Ruth Close	Wells	9	900
Tuscarora	Z. F. Wheeler	Mrs. Ruth B. Leonard	Tuscarora	9	1350
Twelve Mile	C. C. Crone	Laura Vayne	Montello	8	1200
Taber City	Robert F. Gully	Mrs. Robt. Anderson, Jr.	Metropolis	8	
Upper South Fork	C. C. Drown	Mrs. Inez Schillerstrom	Lee	10	1250
Van Duzer	Homer W. Audrae	Mrs. W. W. Ellsberry	Mountain City		
Weiland	E. E. Oldham	Della Oldham	Elko	9	945
Wells Grammar	Mrs. H. H. Cazier	Florence Tannahill, Prin.	Wells	10	1600
		Margaret G. McDonald	Wells		1300
		Ruth Dean Daugherty	Wells		1300
		W. J. Freed, Principal	Wells	10	2500
		Louise C. Armstrong	Wells		1800
		Ula Reed	Wells		
Elko County High School No. 2	W. R. Englert	Clara B. Plumb	Whiterock	9	1215
		Edith Wyman	Gold Creek	4	400
Whiterock	Henry Winter				
Wilson*	Emery Johnson				

*Summer school.

Second Supervision District—Eureka, Lander, and White Pine Counties

County and district	Clerk	Teachers	Postoffice	Term mo.	Sal- ary
EUREKA					
Aerial	Mrs. Floyd Grimes	May Christopher	Austin	8	\$680
Alpha	Nick Modarelli	Mrs. V. C. Garten	Alpha	8	1000
Antelope	John Blair	C. B. Page	Eureka	8	1000
Birch	Mrs. J. R. Jacobson	Andrew J. Crofut	Eureka	8	680
Beowawe	C. E. Kalb	Mary B. Shultes	Beowawe	8	960
Damele	Antone Damele	Beulah Meyer	Tonkin	8	960
Diamond	Edgar Sadler	Stella Gianoli	Romano	8	1040
Eureka	Frank C. Lewis	L. A. Hunting, Principal	Eureka	10	2200
		Chrystie MacGillivray	Eureka		1250
		Ruby Simonsen	Eureka		1250
		Ester Bjorn	Eureka		1250
		Isabel Meriardo	Eureka		1250
Fye Canyon	Mrs. Mary Isaac	Gertrude Harbour	Tonkin	8	1000
Grass Valley	Mrs. Emil Bauman	Elsie Johanningsmeir	Cortez	8	1000
Italian Ranch	Chas. Depaol	Fanny Gibson	Eureka	8	960
Mineral Hill	B. H. Bruffey	Mrs. Mercie Sampson	Mineral	8	880
Palisade	Wendel Jones	Cordelia Wallace	Palisade	10	1300
Pine Mountain	Mrs. W. S. Raine	Grace B. Spracklin	Palisade	8	880
Pine Valley	Sue Leavitt	Ella Hilderbrand	Palisade	8	880
Pinto	Mrs. P. Schaeffer	Anna S. Lederer	Eureka	8	680
Prospect	Marie Bertino	Annie Harvey	Prospect	8	800
Ruby Hill	J. W. Kitchen	Adeline Jeffries	Eureka	8	920
Roberts Creek	Isadore Sara	Margaret C. Yates	Eureka	8	800
Three Bar	Bernard Damele	Elsie Hooper	Eureka	8	800
Cottonwood	James Hunter	(Dormant)	Eureka		
County High School	E. A. Skillman	L. A. Hunting, Principal	Eureka	10	2200
		Josephine Foster	Eureka		1500
		Estha Rodkey	Eureka		1500
LANDER					
Austin	H. A. Kearns	Lavina Mullie, Principal	Austin	10	1650
		Helen Quinlan	Austin		1350
		Margaret Myles	Austin		1300

CLERKS OF SCHOOL BOARDS, AND TEACHERS—Continued

County and district	Clerk	Teachers	Postoffice	Term mon.	Sal- ary
Allen.....	Chas. Allen.....	Laura L. Isaac.....	Cortez.....		
Battle Mountain.....	F. H. Triplett.....	C. F. Waltman, Principal. HIGH SCHOOL.....	Battle Mountain.....	10	\$2250
		Ruth La Kamp.....	Battle Mountain.....		1400
		Nell Kerrigan.....	Battle Mountain.....		1400
		ELEMENTARY SCHOOL.....			
		Ann O. Miller.....	Battle Mountain.....		1250
		Sarah R. Marshall.....	Battle Mountain.....		1250
		Lela Halsell.....	Battle Mountain.....		1250
		Eliza Pierce.....	Battle Mountain.....		1250
Hill Top.....	E. O. Swackhamer.....	Margaret Thornton.....	Hilltop.....	8	1000
Iowa Canyon.....	Jas. Litster.....	Vivian Kensinger.....	Battle Mountain.....	8	1000
Kingston.....	H. S. Meyer.....	Mildred Caton.....	Austin.....	8	1040
Tenabo.....	Mrs. A. E. Raleigh.....	Florence L. Montgomery.....	Beowawe.....	8	920
Twin Springs.....	Louisa Brackney.....	Laura L. Isaac.....	Cortez.....		
WHITE PINE					
Big Spring.....	Mrs. Chas. Smith.....	W. E. Hill.....	Garrison, Utah.....	8	1000
Blackhorse.....	D. S. Eldridge.....	Julia R. Halladay.....	Osceola.....	8	1000
Bothwick.....	W. C. Bradley.....	(No report).....	Ely.....		
Cherry Creek.....	F. L. Pierce.....	Mrs. I. W. Jordan.....	Cherry Creek.....	8	1120
East Ely.....	G. L. Deckelman.....	Eva H. Timmons, Prin.....	East Ely.....	10	1750
		Lillian D. Harris.....	East Ely.....		1400
		Mildred M. Marriott.....	East Ely.....		1400
		Ruth N. Oliver.....	East Ely.....		1400
		Adelaide Rene.....	East Ely.....		1400
		Eva B. Torrence.....	East Ely.....		1400
Ely.....	R. H. Holtzman.....	Mary S. Black, Principal.....	Ely.....	10	2100
		LaVeta Harrison.....	Ely.....		1400
		Nettie Taylor.....	Ely.....		1400
		Ophelia Gilmore.....	Ely.....		1400
		Olivia Devereaux.....	Ely.....		1400
		Sabilla Howell.....	Ely.....		1400
		Ruby Rogers.....	Ely.....		1400
		Ida Henry.....	Ely.....		1400
		Adelaide Hilling.....	Ely.....		1400
		Jeanne Dooley.....	Ely.....		1400
		Carolyn Ostmo.....	Ely.....		1400
Goshute.....	Mrs. P. H. Green.....	Bertha Maller.....	Cherry Creek.....	8	920
Gregory.....	Mrs. A. Bellander.....	Dorothy Meyers.....	Osceola.....	8	880
Griswold.....	Mrs. Jane Zubiri.....	(No report).....	Cherry Creek.....		
Hamilton.....	Frank Zadow.....	R. A. Dean.....	Hamilton.....	3	300
Kimberly.....	E. A. Hewett.....	Estelle Tyson.....	Kimberly.....	10	1500
		Eva B. Norris.....	Kimberly.....		1400
Lane City.....	J. N. Moynaux.....	Mrs. J. E. Wayman.....	Ely.....	10	1400
Lund.....	J. J. Gubler.....	Clifton L. Boyle, Prin.....	Lund.....	10	1250
		Ethel Neilson.....	Lund.....		1250
		Etta McSpadden.....	Lund.....		1250
McGill.....	R. E. Middagh.....	Doty Tipton, Principal.....	McGill.....	10	2250
		Edith R. Oldman.....	McGill.....		1300
		Frances Bagwill.....	McGill.....		1150
		Delight Willis.....	McGill.....		1250
		Anna C. McAlpine.....	McGill.....		1250
		Elgy McIntosh.....	McGill.....		1300
		Nell Hilton.....	McGill.....		1300
		Cora M. Clark.....	McGill.....		1350
		Mabelle D. Tulin.....	McGill.....		1250
		Mrs. Lloyd Chapman.....	McGill.....		1250
		Maude E. Jarbo.....	McGill.....		1250
		Charlotte Beck.....	McGill.....		1300
		Goldie Butcher.....	McGill.....		1250
Muncy.....	J. B. Dolan.....	Mrs. Artie Zedler.....	Aurum.....	8	960
Valley.....	Wm. Robinson.....	Winifred Smith.....	Eureka.....	6	420
Wilson.....	Chas. Miller.....	R. E. Quinn.....	Aurum.....	8	1000
Willow Grove.....	Eva Alred.....	Geraldine Rosevear.....	Freston.....	8	880
Piermont.....	Forrest B. Matson.....	Gertrude N. Davies.....	Shellbourne.....	8	1000
Pleasant Valley.....	Mrs. V. Henroid.....	Myra Reusser.....	Parker.....	8	1000
Preston.....	Nettie Bradley.....	Mrs. E. M. Woods.....	Preston.....	10	1220
		Eloise Woods.....	Preston.....		1220
Ruth.....	Arthur A. Shell.....	Chester V. Davis, Prin.....	Ruth.....	10	1800
		Alma Shartle.....	Ruth.....		1200
		Muriel Robling.....	Ruth.....		1200
		Lucy L. Foster.....	Ruth.....		1200
		Adelaide Davis.....	Ruth.....		1200
Shingle Creek.....	E. B. Robison.....	Alice R. Spencer.....	Osceola.....	8	820
Robison.....	Jas. F. Robison.....	Gwendolyn Griffith.....	Osceola.....	8	1000
Shoshone.....	Richard Swallow.....	Ruth Raymond.....	Shoshone.....	8	808
Siegel.....	H. L. Anderson.....	Almira Anderson.....	Shellbourne.....	8	1000
Snake Valley.....	George Baker.....	Margie Quate.....	Baker.....	8	1040
		Yerda Mattson.....	Baker.....		1040
State Line.....	Mrs. Eva Tweedy.....	(No report).....	Garrison, Utah.....		
Step toe.....	John Buzetti.....	Harriet Boyd.....	Step toe.....	8	1000

CLERKS OF SCHOOL BOARDS, AND TEACHERS—Continued

County and district	Clerk	Teachers	Postoffice	Term mos.	Sal- ary
Taft.....	John Yelland.....	Clara M. Anderson.....	Cleveland Ranch	8	\$1000
White River.....	Owen Casier.....	Mrs. Eva Peterson.....	Preston.....	8	1000
County High School..	B. L. Quayle.....	A. S. Kubitz, Principal..	Ely.....	10	3000
		Mrs. H. K. Bieghler.....	Ely.....	.....	1800
		Helene Fliege.....	McGill.....	.....	1750
		Selma Braem.....	Ely.....	.....	1800
		E. Ida Waltz.....	Ely.....	.....	1800
		Karl Kellog.....	Ely.....	.....	2000
		James P. Carpenter.....	Ely.....	.....	2000

Third Supervision District—Churchill, Humboldt, and Pershing Counties

County and district	Clerk	Teachers	Postoffice	Term mos.	Sal- ary
CHURCHILL					
Consolidated B.....	Mrs. Eli Cann.....	J. J. Beaty, City Supt.....	Fallon.....	12	\$2500
		Loria D. Smith, Prin.....	Fallon.....	10	1600
		Laura E. Mills.....	Fallon.....	.....	1850
		Irma Bendle.....	Fallon.....	.....	1850
		Marguerite A. Heller.....	Fallon.....	.....	1900
		Theo. Irene Smart.....	Fallon.....	.....	1800
		Jessamine Raymond.....	Fallon.....	.....	1800
		Phyllis Burnett.....	Fallon.....	.....	1850
		Mrs. Lucy G. Burton, Pr.....	Fallon.....	.....	1500
		Adah Gerjets.....	Fallon.....	.....	1350
		Fern S. Reynolds.....	Fallon.....	.....	1800
		Mary B. Leith.....	Fallon.....	.....	1800
		Jessie F. Vann, Prin.....	Fallon.....	.....	1500
		Maud R. Williams.....	Fallon.....	.....	1800
		Heater Mills.....	Fallon.....	.....	1300
		Florence Richards.....	Fallon.....	.....	1800
		Ada C. Samson.....	Fallon.....	.....	1800
		Mrs. Ruth Rice.....	Fallon.....	.....	1000
Dixie.....	Jesse W. Tyrrell.....	Mrs. Lillie H. Stark.....	Dixie Valley.....	9	900
Harmon.....	Fred A. Nelson.....	Mrs. J. Hughes, Prin.....	Fallon.....	9	1085
		Ruth E. Candee.....	Fallon.....	.....	980
Hazen.....	Mrs. Arthur Pyle.....	Mrs. M. Peterson, Prin.....	Hazen.....	9	1170
		Grace S. Mills.....	Hazen.....	.....	1080
Island.....	H. E. Smith.....	E. Mae Smith.....	Fallon, RFD.....	9	1085
Lone Tree.....	George Miller.....	Mrs. Louise M. Roy.....	Fallon, RFD.....	8	880
Northam.....	Mrs. V. Fulkerson.....	Mrs. Daisy D. Lucas.....	Fallon, RFD.....	9	1085
St. Clair.....	Mrs. J. W. Johnson.....	Grace E. Cowan.....	Fallon, RFD.....	9	1125
Stillwater.....	C. E. Kent.....	Dorrie Brown.....	Stillwater.....	9	1085
		Mrs. Emily H. Redding.....	Stillwater.....	.....	980
Wonder.....	Louis H. Danberg.....	Mrs. Jennie Wilder.....	Wonder.....	8	1040
County High School..	Mrs. M. H. Wallace.....	L. A. Fringle, Principal..	Fallon.....	12	3000
		Clara E. Balmat.....	Fallon.....	10	1800
		Georgia C. Damm.....	Fallon.....	.....	1800
		Minnie S. Wolf.....	Fallon.....	.....	1800
		Elva Helene Clark.....	Fallon.....	.....	1800
		Mrs. Bessie J. Railey.....	Fallon.....	.....	1800
		Ralph A. Jones.....	Fallon.....	.....	2400
HUMBOLDT					
Big Creek.....	See Two Creeks.....				
Bottle Creek.....	See Two Creeks.....				
Cane Springs.....	I. B. English.....	Madge Brooks.....	Amos.....	8	960
Central.....	Gerhard Miller, Jr.....	Mrs. Louise Boskovich.....	Winnemucca.....	8	880
Crossing.....	William DeLong.....	Lulu E. Weseman.....	Sulphur.....	8	845
Denio.....	Mrs. Mary C. Hill.....	Nellie Van Drielen.....	Denio, Oregon.....	8	1040
Dyke.....	Mrs. M. E. Woodward.....	Mrs. Clara Holloway.....	Amos.....	8	960
Fort McDermitt.....	Lora Lasa.....	Mrs. Kate M. Gourley.....	McDermitt.....	8	800
Golconda.....	F. J. Curley.....	Mrs. Florence Lowry, Pr.....	Golconda.....	9	1260
		Eugenie Langwith.....	Golconda.....	.....	1170
Jackson Mountain.....	Fred C. Hummel.....	Anna Billingsley.....	Jungo.....	9	900
Jungo.....	Mrs. G. B. Austin.....	Louise Adams.....	Jungo.....	8	880
Kings River.....	Guadalupe Hurtado.....	Mrs. Helen M. Donnelly.....	Rebel Creek.....	8	880
McDermitt.....	Mrs. Chas. Hewitt.....	Marion F. Royce.....	McDermitt.....	10	1800
McGhee.....	Ed McGhee.....	Olive Guthrie.....	Denio, Oregon.....	8	800
Paradise.....	J. E. Harvey.....	Julia Victor, Principal..	Paradise Valley.....	9	1805
		Clay Hampton.....	Paradise Valley.....	.....	1215
		Nora M. Roberts.....	Paradise Valley.....	.....	1120
River.....	C. K. Norris.....	Frances E. Eichwaldt.....	Platora.....	8	1000
Rosebud.....	G. B. Noble.....	Kathleen A. Kavanagh.....	Sulphur.....	8	1000
Sod House.....	J. M. Legarza.....	Thelma E. Syler.....	Amos.....	8	800
Stonehouse.....	J. W. Planck.....	Mrs. Pauline J. Lattin.....	Valmy.....	8	920
Two Creeks.....	Tilden Martin.....	Mollie Somers.....	Amos.....	8	880
Winnemucca.....	A. D. Dern.....	Jessie I. Diamond, Prin.....	Winnemucca.....	10	2250
		Henry C. Snyder.....	Winnemucca.....	.....	1800
		Mrs. Carrie C. Bullis.....	Winnemucca.....	.....	1350

County and district	Clerk	Teachers	Postoffice	Term mos.	Sal-ary
Winnemucca (con.)	A. D. Dern	Mrs. Ethel Kibbee	Winnemucca		\$1400
		Minnie Bradshaw	Winnemucca		1350
		Mrs. Susan A. Leach	Winnemucca		1250
		Madeline Horgan	Winnemucca		1400
		Mrs. Cora M. Watt	Winnemucca		1450
		Mrs. Jennie Smith	Winnemucca		1500
		Mrs. Annie T. Card	Winnemucca		1350
		Theodate McKay	Winnemucca		1350
County High School	Mrs. T. D. Brown	J. D. Scott, Principal	Winnemucca	12	2700
		Karl W. Mitchell	Winnemucca	10	1700
		Lydia Colyer	Winnemucca		1500
		Alva Walker	Winnemucca		2000
		Dorothy B. Higgins	Winnemucca		1350
		Agnes Bro Mé	Winnemucca		1500
		Olive E. Terrill	Winnemucca		1500
		Gertrude Webb	Winnemucca		1350
PERSHING					
Big Meadow	Ward H. Martin	Mrs. Louise E. Lucas	Lovelock	9	1170
Buena Vista	Mrs. A. S. Davidson	Mrs. Orva Hammersmark	Unionville	8	1170
Bushee	W. L. Pearce	Anna M. Davis	Winnemucca	9	945
Chafey	Mrs. Thos. Hendra	Myra Taylor	Mill City	8	960
Crescent	Dormant.				
Fairview	Mrs. Wm. Looz	Iris M. Ramsey	Lovelock	10	1250
		Freda Daoust	Lovelock		1250
Fountain	R. E. Umler	Edris Neal	Imlay	9	1080
Imlay	Mrs. Carrie Devine	Mrs. Julia Grant, Prin.	Imlay	10	1400
		Frances Case	Imlay		1300
Lake	William Ast	C. A. Brittell, Principal	Lovelock	10	2400
		May Bowman	Lovelock		1500
		Carice Smith	Lovelock		1400
		Hattie Burnett	Lovelock		1350
		Mrs. Ann E. Garnier	Lovelock		1300
		Leora Noel	Lovelock		1300
		Grace Fuss	Lovelock		1400
Lower Rochester	Mrs. C. C. Higgins	Mrs. Eva Hartsough	Lower Rochester	9	1125
Mill City	Peter Organ	Mrs. Alice L. Haworth	Mill City	9	1080
Oreana	Mrs. J. B. Newman	Harry Louis Kessell	Oreana	9	1170
Packard	Dormant.				
Rochester	Dr. J. R. Gill	Mrs. Grace B. Staples	Rochester	9	1350
Star	N. C. Frendesen	M. A. Leonard	Imlay	8	960
County High School	P. A. Quigley	H. W. B. Baker, Prin.	Lovelock	12	2400
		Adele E. Armstrong	Lovelock	10	1300
		Vivian Tarbox	Lovelock		1600
		Mary B. Beatty	Lovelock		1400
		Ralph R. Rice	Lovelock		1600

**Fourth Supervision District—Douglas, Lyon, Mineral, Ormsby,
Storey, and Washoe Counties**

County and district	Clerk	Teachers	Postoffice	Term mos.	Sal-ary
DOUGLAS					
Centerville	H. R. Schwake	Dorothy E. Rayercraft	Gardnerville	9	\$945
Central	J. H. Stodieck	Anna Heise	Gardnerville	9	960
Consolidated A	L. R. Jacobsen	Mrs. Geraldine Davis, Pr.	Gardnerville	9	1350
		Mrs. Kirstine Doane	Gardnerville		1035
		Katie Drown	Gardnerville		1035
		Josephine Helwinkle	Gardnerville		1035
Consolidated B	J. A. Cardinal	Alice O'Brien, Principal	Minden	9	1350
		Mary J. Raitt	Minden		1260
Douglas	Mrs. M. Schneider	Union school with Carson.	Gardnerville	9	855
Fairview	Mrs. W. F. Dressler	Ruth L. Hull	Genoa	9	1080
Genoa	Mrs. Joe Campbell	Mrs. Rilla Williamson, Pr.	Genoa		960
		Berenyce Moore	Genoa		900
Mottsville	William Hansen	Rose M. Rey	Gardnerville	12	2600
County High School	Fred Settemeyer	Benj. M. Aldrich, Prin.	Gardnerville	12	2200
		C. L. Hargrave	Gardnerville	9	1500
		Mildred M. Boyd	Gardnerville		1400
		Theresa Costa	Gardnerville		1400
		Mildred S. Bell	Gardnerville		1400
LYON					
Artesia	Mrs. James O'Brien	Eleanor Mollart	Artesia	9	900
Barrett	Mrs. G. E. Batchelder	Opal Gerton	Verington	9	920
Canal	W. G. Rawles	Milton J. Mallery, Prin.	Fernley	9	1350
		Dorothy Cousins	Fernley		1125
		Esther Crump	Fernley		1125
Dayton	Ray D. Johnson	Fred M. Gerlach, Prin.	Dayton	10	2400
		Mrs. Bertha Berger	Dayton		1250
		Frances Heidenreich	Dayton		1250

CLERKS OF SCHOOL BOARDS, AND TEACHERS—Continued

County and district	Clerk	Teachers	Postoffice	Term month	Sal- ary
Gallagher	Peter Gallagher	Mrs. Mary Freeman	Yerington	8	\$920
Ludwig	Roland Gibson	Mrs. Jeannette Bragg	Ludwig	8	920
Mason	Mrs. I. S. Dickson	Mrs. M. E. Sturgeon, Pr.	Mason	9	1080
		Edna Schacht	Mason	8	990
Meissner	Peter Henrichs	Marie E. Sweetman	Yerington	10	1100
Mound House	Roy Mitchell	Sadie Sullivan	Mound House	8	800
Perry	C. C. Perry	Mrs. Laura Frasier	Yerington	9	1080
Plummer	John McGowan	Mrs. Mae E. Tillay	Mason	8	1080
Railroad	J. M. Feeney	Mrs. Theresa Smith, Pr.	Wabuska	8	800
		Amy Mollart	Wabuska	8	800
Sanders	Edward Knemeyer	Mrs. P. B. Karasus, Prin.	Yerington	9	1080
		Ann B. Gordon	Yerington	8	900
Silver City	William Donovan	Mrs. Mary G. McNamara	Silver City	9	1125
Smith Valley Cons.	Mrs. M. Mann	Beatrice A. Bell	Smith	8	1000
		Arlie Jessen	Simpson	8	1000
		Ruth M. Scottsford	Smith	8	960
Sutro	Mrs. Sarah Winnie	Mrs. Louise Kimble	Sutro	8	880
Wabuska	James O. Parker	Gladys E. Fraser	Wabuska	8	880
Yerington	A. S. Phipps	Mina Connell, Prin.	Yerington	10	1800
		Mrs. Ruth Mason	Yerington	1200	
		Ethel Welsh	Yerington	1200	
County High School No. 1	Dr. G. E. Leavitt	Mrs. Elizabeth McKay	Yerington	1200	
		Rita Bliss Keyser	Yerington	1200	
		R. J. Hill, Principal	Yerington	10	2850
		Willis Smith	Yerington	12250	
		Ella N. Swanson	Yerington	1800	
		Francine K. Dardis	Yerington	1600	
		Avis Lothrop	Yerington	1450	
County High School No. 2	R. A. Trimble	Mrs. O. P. Riker	Yerington	1600	
		Fred M. Gerlach, Prin.	Dayton	10	2400
County High School No. 3	L. S. Beaman	Edith Claire Harris	Dayton	1500	
		Mrs. Ola B. Rollins	Dayton	1500	
		Edna Greenough	Smith	9	1350
MINERAL					
Aurora	Joe Bailey	Dormant	Sweetwater		
Cambridge	Mrs. Ambro Rosaschi	Mrs. L. H. Gilman	Yerington	8	1080
Candelaria	Harold E. Queen	Not in session	Mina		
East Walker	Mrs. John Wichman	Anna L. Nichols	Wichman	9	1080
Hawthorne	Charles Dimock	Loretta S. Kenny, Prin.	Hawthorne	10	1650
		J. Marjorie Cross	Hawthorne	1450	
Luning	Ernest Rackliff	Ida S. Hogeneson	Luning	10	1500
Mina	L. B. Spencer	Mrs. Anna Moore, Prin.	Mina	10	1650
		Irene Dunn	Mina	1500	
Schurz	C. B. Folts	Reva B. Simpson	Schurz	9	1125
Simon	E. E. King	Mrs. Etta Stromer	Mina	8	1000
Sweetwater	Frank Yparraguirre	Grace McVicar	Sweetwater	8	1200
County High School	Mrs. Marie Stannard	U. W. Keplinger, Prin.	Hawthorne	10	2100
		Annie V. Hull	Hawthorne	1600	
ORMSBY					
Carson City	Frank Meder	E. L. McKeown, Supt.	Carson City	12	3000
		HIGH SCHOOL			
		Laurence Hansen	Carson City	10	1800
		G. E. Hofmann	Carson City	1800	
		Edith G. Woolridge	Carson City	1600	
		Florence L. Bray	Carson City	1650	
		Blanche T. Lothrop	Carson City	1500	
		ELEMENTARY			
		Mrs. Martha Gleason	Carson City	1300	
		Rose M. Jones	Carson City	1250	
		E. Genevieve Harris	Carson City	1150	
		Mary V. Belli	Carson City	1150	
		Emma M. Benton	Carson City	1150	
		Lizzie Sanger	Carson City	1200	
		Theresa F. Schulz	Carson City	1150	
		Alice E. Bryant	Carson City	1300	
Clear Creek	Union with Carson.				
Empire	Mae F. McNamara	Mrs. Madge Raycraft	Carson City	10	1200
Lakeview	H. Downs	Martha Patterson	Carson City	10	900
STOREY					
Derby (Joint)	H. E. Ordway	Mrs. Clara Patterson	Derby	9	1080
Gold Hill	Arthur J. Staricha	Mrs. Mary Whipple	Gold Hill	8	1000
Virginia City	J. M. Leonard	H. O. Williams, Prin.	Virginia City	10	3000
		HIGH SCHOOL			
		J. J. Clancey	Virginia City	1750	
		Zora Vaughan	Virginia City	1500	
		Phyllis J. Brown	Virginia City	1250	
		ELEMENTARY			
		Anna V. Chatham	Virginia City	1100	
		Marion C. McKenzie	Virginia City	1100	

County and district	Clerk	Teachers	Postoffice	Term mos.	Sal- ary
Virginia City (con.)	J. M. Leonard	Mrs. Sadie F. Smith Grace Sullivan Mrs. Katie G. Quirk	Virginia City Virginia City Virginia City	12	\$1100 1100 1100
School of Mines	J. M. Leonard	Dwight T. Smith	Virginia City	12	2400
WASHOE					
Anderson	R. M. Guthrie	Adeline Savery	Reno, RFD 1	9	900
Browns	Mrs. J. S. Lyons	Mrs. Ethel Zimmer	Steamboat	10	900
Clark (Joint)	John P. Williams	Wilhelmina Purcell	Derby	10	1300
Cold Springs	Mrs. Nellie Norton	Maud Jacob	Vya	8	920
Franktown	W. F. Sauer	Laura F. Shurtliff	Franktown	9	810
Gerlach	W. S. Murdock	Mrs. Rose Rogers	Gerlach	9	1080
Glendale	Louis Raffetto	Mary A. Henry	Reno, RFD 2	9	990
Green Springs	Mrs. Effie Swanson	Dormart	Vya		
Huffakers	J. L. Hash	Mrs. Margaret Evans, Pr.	Reno, RFD 1	9	990
Laughtons	R. T. Smith	Claire Hofer	Reno, RFD 1		
Mill Station	Mrs. Letitia Foust	Mrs. Blanch Preston	Verdi	9	900
North Truckee	A. N. Gault	Marie Norton	Franktown	9	810
Olinghouse	Mrs. Emma Dallimore	Ruth E. Leon	Reno, RFD 2	9	1045
Pyramid	Mrs. A. J. Olds	Mrs. Faith Ausseresse	Olinghouse	8	720
Consolidated P. W.	Oliver Iverson	Huldah D. Rippee	Constantia, Cal.	9	900
Red Rock	Mrs. Walter Brown	Louise M. Vieira	Gerlach	8	1000
Reno	Theo W. Clark	Mrs. Minnie K. Hargus	Constantia, Cal.	8	800
		B. D. Billingshurst, Supt.	Reno	12	5000
HIGH SCHOOL					
		E. Otis Vaughn, Prin.	1037 Sierra	12	3100
		Agnes Bell	710 Sierra	10	1800
		Alma Boeke	769 N. Virginia		1800
		Effie Mack	428 Hill		1800
		Alwine Sielaff	317 Maple		1800
		Ina Meredith	Colonial Apts.		1800
		Mrs. Anna Loomis	444 W. Sixth		1800
		Anna C. Taylor	535 Nevada		1800
		Harriett White	304 Roberts		1800
		Bernice L. Crosby	Colonial Apts.		1700
		Mila Coffin	251 W. Fifth		1700
		Alice Foxwell	307 W. Fourth		1800
		Christine Cravens	658 N. Center		1600
		Bettie Westphal	304 Roberts		1700
		Helen Hobbins	829 N. Virginia		1800
		Nina Stephens	701 N. Center		1700
		Vera Dalles (part work)	Manzanita Hall		600
		Sylvia Langford	484 E. Seventh		1600
		Flora Collier	347 Ralston		1700
		Frank Palmer	Y. M. C. A.		2100
		Levant Thompson	437 E. Sixth		2100
		C. P. Russell	621 N. Virginia		2050
		G. L. Hicks	621 N. Virginia		2050
		Capt. Douglas Page	844 N. Center		600
ELEMENTARY					
<i>Orvis Ring—</i>					
		Mrs. L. C. Booth, Prin.	421 Sierra		1750
		Ethel St. Clair	220 Maple		1400
		Frances Wright	753 N. Center		1500
		Georgia MacNair	705 N. Virginia		1500
		Mrs. C. H. Luke	420 N. Virginia		1500
		Helen Hanley	772 Holcomb A.V.		1500
		Helene Banta	418 Maple		1500
		Elizabeth McCormack	329 Mill		1500
		Georgiana Steiner	345 12th Sparks		1400
		Mrs. J. K. Logan	115 Mill		1500
<i>Mary S. Doten—</i>					
		Pearl Stinson, Prin.	428 Sinclair		1650
		Estelle Prouty	126 W. Tenth		1500
		Blanche Radley	484 E. Seventh		1400
		Grace Harris	661 Ralston		1400
		Florence Jones	1119 Wheeler		1400
		Emma Smith	311 W. Fifth		1500
		Veronica Dickey	769 S. Virginia		1450
		Bernardine Lyng	434 Washington		1400
		Daisy Benjamin	101 State		1400
<i>McKinley Park—</i>					
		Lucy Parker, Prin.	201 Vine		1750
		Matilda Feretti	142 Vine		1500
		Hazel Meek	923 W. Second		1400
		Mrs. Pearl Domingues	203 Vine		1500
		Edith Erickson	347 Ralston		1400
		Katherine Rannelle	735 N. Virginia		1500
		Gladys Jones	127 W. Fourth		1400
		Emilie Yparraguirre	702 Plumas		1500

CLERKS OF SCHOOL BOARDS, AND TEACHERS—Continued

County and district	Clerk	Teachers	Postoffice	Term mos.	Salary
Reno (continued)	Theo W. Clark	<i>Southside—</i>			
		Frances Frey, Prin.	Reno, RFD 2		\$1750
		Elizabeth Smith	214 Stewart		1400
		Margaret Hinch	517 E. Sixth		1500
		Mary Harrington	339 West		1400
		Florence Shirley	31 W. Ninth		1500
		Marie Lloyd	716 Humboldt		1500
		Agnes Maxwell	217 E. Taylor		1500
		Elvina Blevins	141 W. Fifth		1400
		Ina Powers	828 N. Virginia		1500
		Jessie Beck	618 Sinclair		1500
		<i>Kindergarten—</i>			
		Hazel Stewart	102 Burns		1450
		<i>Mt. Rose—</i>			
		Beulah Morgan, Prin.	461 Nevada		1750
		Mamie Towles	Tonopah, Pueblo		1400
		Eva Skinner	Tonopah, Pueblo		1400
		Alice Meffley	304 W. Sixth		1500
		Gertrude Tailleux	918 W. Second		1500
		Isabel Bertschy	519 Humboldt		1500
		Hazel Fowler	150 Ridge		1500
		<i>Babcock Primary—</i>			
		Maud Bishop	Frandsen Apts.		1400
		<i>Kindergarten—</i>			
		Winifred Cockrell	628 N. Lake		1600
		Georgia Latta	619 Lake		1450
		<i>SPECIAL GRADES</i>			
		Mae Gonterman	Frandsen Apts.		1700
		Marie L. Kern	102 Burns		1700
		Blanche Miller	Frandsen Apts.		1700
		Myrtle Foster	769 N. Virginia		1600
Rye Patch	A. E. Anderson	Union with Squaw Valley ..	Gerlach		
Salt Marsh	A. V. Heller	Lois Discher	Sheephead	8	800
Spanish Springs	Geo. Blundell	Elva F. Colquhoun	Sparks	7	700
Sparks		C. H. Meeker, Supt.	Sparks	12	3000
		<i>HIGH SCHOOL</i>			
		M. P. Sherman	Sparks	20	1800
		J. T. Perigo	Sparks		1620
		Mrs. Elizabeth Brower	Sparks		1560
		Edith S. Harris	Sparks		1620
		Gertrude C. Jones	Sparks		1500
		Algott E. Anderson	Sparks		1680
		Mrs. Hazel Moore	Sparks		1560
		Howard T. Smith	Sparks		1500
		<i>ELEMENTARY</i>			
		Maude Frazier, Principal ..	Sparks		1800
		Mrs. Maud Johnson	Sparks		1320
		Mrs. P. E. Groesbeck	Sparks		1320
		Florence Neighbors	Sparks		1200
		Alice Maxwell	Sparks		1380
		Anna J. Rieve	Sparks		1320
		Lena B. Junniper	Sparks		1200
		Selma Sielaff	Sparks		1200
		Bonnie Stephens	Sparks		1320
		Josephine Legate	Sparks		1200
		Mrs. Florence Drake	Sparks		1320
		Viola M. Blevins	Sparks		1260
		Mary E. Lukens	Sparks		1320
		Mrs. Mary M. Sherman	Sparks		1320
		Agnes Lucey	Sparks		1260
		Ruth C. Pritchett	Sparks		1200
		Dana Shoptaugh	Sparks		1320
Squaw Valley	A. Jenkins	Mrs. Christina Harris	Gerlach	9	1125
Twin Springs	E. J. Sharp	No report	Vya		
Verdi	J. B. Law	Cecilia Meighan, Prin.	Verdi	10	1600
		Mrs. Dora Lee Koespan	Verdi		1200
		Mrs. A. Belle McMillan	Verdi		1200
Vista	Mrs. John Cassi	Mrs. Laura Greeley	Reno, RFD 2	8	880
Wadsworth	E. G. Crittenden	Mrs. M. H. Kohler, Prin.	Wadsworth	9	1080
		Martha Gee	Wadsworth		990
Washoe	F. J. Sauer	Salome Riley	Washoe	9	900

County and district	Clerk	Teachers	Postoffice	Term mo.	Sal- ary
CLARK					
Educational No. 1, Bunkerville	W. H. Lyons	A. L. Kelly, Supt. Delilah Booth Adams Mabel Duval Lee Leavitt L. Raymond Nelson, Pr. Ruth West K. E. Fordham Douglas I. Cannon Grace M. Dinges Irma Weiser	Overton Bunkerville Bunkerville Bunkerville Bunkerville Bunkerville Bunkerville Bunkerville Bunkerville Bunkerville	12 9 9 10 9 9 9 9 9 9	\$2700 1140 1170 1125 2450 1200 1620 2200 1800 1500
Mesquite		Hazel Kepley, Principal Ethlyn Kepley Emma C. Abbott Eunice E. Metcher	Mesquite Mesquite Mesquite Moapa	9 9 9 9	1350 1150 1120 1250
Moapa		Ella Hafen, Principal Kathryn Perkins Leah Shurtliff	Overton Overton Overton	9 9 9	1800 1150 1150
Overton		A. E. Jones, Principal Grace D. Howell Lewis E. Rowe Mary McWilliams Mary Anderson Binns Heber A. Curtis W. J. Flowers	Overton Overton Overton Overton Overton Overton Overton	10 9 9 9 9 9 9	2500 1550 1900 1440 1800 2200 1575
Crescent	Mrs. C. A. Swingle	Dormant	Searchlight		
Enterprise	A. C. Wells	Helena D. Gleeson	Arden	9	1125
Goodsprings	W. E. Stromer	Winnifred Riddall Helen Robbins	Goodsprings Jean	9 9	1125 1125
Las Vegas	H. M. Lillis	J. N. Stewart, Principal Helen Lucile Potter Matt Kelly Geraldine Clayton Winnifred Gardner Winnifred E. Coen Johanna Sullivan Mattie Reed Alberta Andrus Elsa Clayton Katherine Casey Katherine Schwarze Dora Lee	Las Vegas Las Vegas Las Vegas Las Vegas Las Vegas Las Vegas Las Vegas Las Vegas Las Vegas Las Vegas Las Vegas Las Vegas Las Vegas Las Vegas	10 9 9 9 9 9 9 9 9 9 9 9 9 9	1800 900 500 1250 1250 1250 1250 1250 1250 1250 1250 1250 1250 1250
Las Vegas High School	Helen J. Stewart	J. A. Raitt, Principal J. F. Mayes Corine Kipp Edwene Clough Gladys Wolf Helene L. Potter (Music) Mrs. Annie Smith Mrs. Mayme T. Smith	Las Vegas Las Vegas Las Vegas Las Vegas Las Vegas Las Vegas Goodsprings Searchlight	12 9 9 9 9 9 6 9	3000 2340 1650 1650 1650 1650 900 1350
ESMERALDA					
Blair Junction	Mrs. Nina Howard	Mrs. Nella G. Harbaugh	Tonopah	8	1160
Clayton	F. A. Vollmar	Katherine Pinchey	Silver Peak	9	1260
Columbia	Mrs. T. F. May	Union with Goldfield	Goldfield		
Divide City	Leonard Wills	Mrs. Ethel B. McGuire	Tonopah	9	1350
Dyer	J. A. Molini	Treva G. Kellogg	Dyer	9	1125
Goldfield	Gordon M. Bettles	A. W. Armitage, Supt. HIGH SCHOOL Frances Barron Hilda Ward Elsa von Dornum ELEMENTARY SCHOOL Pauline Marcotte Josephine Moorman Nellie F. Burke Mary T. Falvey Rita A. Cannon Mary Gallagher Dormant Norma Carl Mrs. Jessie L. Greenough Louis E. Barber	Goldfield Goldfield Goldfield Goldfield Goldfield Goldfield Goldfield Goldfield Goldfield Goldfield Goldfield Hornsilver Goldfield Tonopah Dyer	10 9 9 9 9 9 9 9 9 9 9 9 9 9 9	2700 1500 1600 1687 1500 1500 1462 1600 1425 1450 1450 1450 1125 1440 1080
Hornsilver	Mrs. M. W. Mitchell				
Lida Valley	Mrs. Florence Kitchen				
Millers	J. S. Ramsay				
White Mountain	Mrs. S. R. Kennedy				

CLERKS OF SCHOOL BOARDS, AND TEACHERS—Continued

County and district	Clerk	Teachers	Postoffice	Term mo.	Sal- ary
LINCOLN					
Alamo.....	W. B. Thorne.....	Charity Leavitt.....	Alamo.....	8	\$1000
Bullionville.....	T. E. Dula.....	Emma Richards.....	Alamo.....	8	1000
Caliente.....	J. L. Denton.....	Mary Syphus.....	Caliente.....	6	720
		C. J. Ritchey, Principal.....	Caliente.....	9	1860
		Bess Roush Callaway.....	Caliente.....	8	1350
		Mary A. Mooney.....	Caliente.....	8	1350
Camp Valley.....	F. R. Donahue.....	Maud E. Holland.....	Ursine.....	6	750
Carp.....	A. L. Gifford.....	Mary West.....	Carp.....	8	960
Clover Valley.....	Wm. Mathews, Jr.....	Walter V. Long.....	Joseco.....	8	1000
Deer Lodge.....	Milton Damron.....	No report.....	Fay.....		
Eagle Valley.....	Wm. Dyer.....	Clare Weber.....	Eagle Valley.....	9	1260
Flat Nose.....	Mrs. Paul Succetti.....	J. Bernice Kaiser.....	Pioche.....	7	700
Geyser.....	J. F. Wambolt.....	No report.....	Pioche.....		
Highland.....	J. B. Wheeler.....	No report.....	Pioche.....		
Hiko.....	Mrs. Ella Schofield.....	No report.....	Hiko.....		
Kiernan.....	Ethel M. Henrie.....	Etta Mariger.....	Elgin.....	8	960
		Verda Potter.....	Elgin.....		960
Panaca.....	Mrs. Rose Higgins.....	G. Quincy Keele, Prin.....	Panaca.....	9	1440
		Eleanor Fahden.....	Panaca.....		1260
		Dora C. Wadsworth.....	Panaca.....		1260
		Fannie R. Higgins.....	Panaca.....		1260
Pioche.....	Dr. W. W. Stockham.....	Winnie M. Thomas.....	Pioche.....	9	1440
		Amy Amsden.....	Pioche.....		1215
		Laura Stephen Devlin.....	Pioche.....		1215
		Ruth E. Craft.....	Pioche.....		1215
Prince Mine.....	Nelson Baker.....	Mrs. H. E. de Roulf.....	Pioche.....	8	1000
Red Rock.....		Dormant.....	Caliente.....		
Richard.....	Mrs. A. J. Richard.....	Marjorie Brown Cottam.....	Alamo.....	6	690
Rose Valley.....	Pat Devlin.....	Virginia Delmuc.....	Pioche.....	8	800
Spring Valley.....	David Francis.....	Rowene Lee.....	Ursine.....	8	1000
Weines Creek.....	Wm. Garrison.....	Dormant.....	Pioche.....		
County High School.....	James Wadsworth.....	H. A. Whiteneck, Prin.....	Panaca.....	12	2500
		C. N. Porter.....	Panaca.....	9	2100
		E. Erastus Hansen.....	Panaca.....		1800
		Lena Norris.....	Panaca.....		1800
		Evelyn LaKamp.....	Panaca.....		1800
		May J. Anderson.....	Panaca.....		1800
		Paul Hagan.....	Panaca.....		2200
NYE					
Beatty.....	C. W. Thomas.....	Mrs. Edna F. Sandberg.....	Beatty.....	8	960
Belmont.....	F. R. Brotherton.....	Pauline Dunn.....	Belmont.....	7	945
Blue Springs.....	W. C. Smith.....	Mrs. Gussie McGinnis.....	Millett.....	6	810
Carrara.....	E. A. Turner.....	Mrs. J. E. Smith.....	Carrara.....		
Charleston.....	F. S. Shoup.....	Eleanor M. Merrow.....	Fahrum.....	8	800
Cherry Creek.....	James T. Deacy.....	Edna Pierce.....	Sharp.....	6	720
Currant.....	H. F. Rutherford.....	May E. Finney (H. S.).....	Currant.....	8	1200
		No report, elementary.....	Currant.....		
Duckwater.....	F. C. Vanover.....	Grace Clendening.....	Duckwater.....	8	1200
Dutch Flat.....	S. C. Worthington.....	Rosa M. Schmalting.....	Austin.....	9	1080
Gardner.....	Mrs. A. B. Gardner.....	Leona Whipple.....	Sunnyside.....	7	770
Hot Creek.....	Mrs. Helene Williams.....		Keystone.....		
Ione.....	R. C. Johnston.....	Mrs. H. A. Phillips.....	Ione.....	8	1000
Italian.....	Mrs. S. R. Bordoli.....	Annette Egge Saxton.....	Sharp.....	7	945
Blue Eagle.....	Mrs. Jos. Sharp.....	Estelle M. Franklin.....	Currant.....	6	750
Manhattan.....	Mrs. A. B. Ronzone.....	A. B. Ritchey, Principal.....	Manhattan.....	9	1845
		Mrs. A. B. Ritchey.....	Manhattan.....		1620
		Mrs. Ida J. North.....	Manhattan.....		1710
Old Reveille Mill.....	Mrs. Lou Kietzke.....	Anna Oudila.....	Arrowhead.....	6	690
Pine Creek.....	Stella Welch.....	Grace Lamb.....	Sharp.....	8	1000
Pioneer.....	No report.....				
Reese River.....	J. F. Bowler.....	Mrs. Florence B. Lynch.....	Austin.....	9	1125
Riordan.....	Mrs. J. C. Riordan.....	Mrs. J. C. Riordan.....	Lund.....		
Reed.....	Mrs. Mabel May.....	Katherine Phillips.....	Goldfield.....	8	1000
Round Mountain.....	Thos. N. Cahill.....	Mrs. Mary T. Lowrey.....	Round Mountain.....	9	1350
		Florence Gomm.....	Round Mountain.....		1260
Success.....	William G. Morris.....	Mrs. Eula McMullen.....	Death Valley.....	8	1000
Sunnyside.....	J. T. Whipple.....	Riato Cornish.....	Sunnyside.....	8	920
Twin Springs.....	Mrs. A. R. Allred.....	Mrs. H. Reischke.....	Tonopah.....	6	480
Tybo.....	Mrs. F. W. Draper.....	No report.....	Tonopah.....		
Tonopah.....	Fred Ninnis.....	George L. Dilworth, Supt.....	Tonopah.....	12	3780
		HIGH SCHOOL.....			
		Victor W. Jones.....	Tonopah.....	10	1980
		Blanche Winham.....	Tonopah.....		1815
		Estella L. Flowers.....	Tonopah.....		1800
		Ella A. Gemmell.....	Tonopah.....		1800
		June L. Wimer.....	Tonopah.....		1800
		Helen A. Holzman.....	Tonopah.....		1560
		Gertrude Bartoo.....	Tonopah.....		1680
		Katherine Swart.....	Tonopah.....		1740
		Isabelle Slavin.....	Tonopah.....		1800

*Including board.

County and district	Clerk	Teachers	Postoffice	Term month	Sal- ary
Tonopah (continued)	Fred Ninnis	ELEMENTARY SCHOOL			
		Irene Lamb	Tonopah		\$1540
		Ruth Averill	Tonopah		1300
		Ivy Cross	Tonopah		1740
		Ruby Schroeder	Tonopah		1740
		Ellen L. Sheerin	Tonopah		1740
		Helene Slavin	Tonopah		1920
		Anna Bradley	Tonopah		1920
		Sarah Gooch	Tonopah		1595
		Edna Parrett	Tonopah		1540
		Blanche Thoborg	Tonopah		1680
		Myrtle T. Brown	Tonopah		1620
		Gladys A. Bennett	Tonopah		1620
		KINDERGARTEN			
School of Mines		Marguerite Levy	Tonopah		1540
		E. R. Bennett	Tonopah	12	2400



BEFORE THE PUBLIC SERVICE COMMISSION OF NEVADA

IN THE MATTER OF INCREASED RATES FOR
WATER SERVICE FILED BY THE STEAM-
BOAT CANAL AND IRRIGATION COMPANY.

CASE No.
I. & S.
U-14

APPEARANCES:

For the Commission—

W. H. SIMMONS, Commissioner.

For Petitioner—

HOYT, NORCROSS, THATCHER, WOODBURN & HENLEY, Counsel;

CHENEY, DOWNER, PRICE & HAWKINS, Counsel;

H. P. GILLETTE, Consulting Engineer;

S. H. WHEELER, President.

For Protestants—

SARDIS SUMMERFIELD, Counsel.

OPINION

SIMMONS, Commissioner:

This case is upon the application of the Steamboat Canal and Irrigation Company, made on February 27, 1920, with schedule attached, for permission to increase the rates for water delivered to various consumers taking water for irrigation purposes from the Steamboat Canal. The rate as per schedule filed to be fourteen (\$14) dollars per inch, effective April 1, 1920, for the irrigation season of 1920 and thereafter, beginning April 15 and ending November 15 of each year.

On March 19 the water users, by their attorney, Sardis Summerfield, filed notice of protest against the proposed schedule of rates, and requested that such schedule of rates be suspended pending hearing and investigation by the Commission. In consideration of the protest filed, the Commission, on March 24, suspended the schedule of rates applied for, pending hearing and investigation as to their reasonableness, and set the case for hearing on April 8, 1920, in Reno. Upon stipulation of all parties in interest the case was continued and came on for final hearing before Commissioner Simmons on June 17 and 18, 1920.

The questions involved in this case are:

What is the fair value of the Steamboat Canal and Irrigation Company's property used in rendering this service? Are the charges made for operating expenses, maintenance, and upkeep reasonable? What rate should be fixed that would be fair to both the canal company and the consumer? It is a well-settled principle with both courts and commissions that a rate should not be fixed to yield a maximum return if

service, and likewise a utility might be permitted to earn in excess of a banking return if the rate charged was reasonable and fair. Upon the question of the value of the property of the canal company the only testimony introduced in this case was that of Mr. H. P. Gillette, appraisal engineer, as appears in a report submitted by him at the hearing and marked Petitioner's Exhibit No. 1. In this report he states that a considerable part of same was taken from a report of valuation of the Steamboat Canal Company made by him on December 11, 1918, using prices as existed in 1914 or prior to the World War, and using as a basis for quantities a survey of the canal made by Mr. D. H. Updike, an engineer employed by the water users in making an appraisal in 1914, and submitted in evidence before the Commission at a previous hearing about that time. Mr. Gillette, in his testimony, states that in 1918, prior to making his 1918 report, he went over the entire ditch with Mr. Updike, Mr. Updike carrying his note-book and explaining his survey and classification of materials as follows:

Earth.....	75,517 cubic yards
Earth and stone.....	173,206 cubic yards
Rock.....	13,300 cubic yards

Total.....	263,023 cubic yards,
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the percentages being:

Earth.....	29%
Earth and stone.....	66%
Stone.....	5%

Mr. Gillette states that the total cubic yards of excavation appears to be approximately correct, but considered that an error was made in classification of materials in that the quantity of rock was underestimated, same being based upon what he saw and his own survey of the Highland Ditch on the opposite side of the valley, which survey indicated 9% of rock instead of 5. (See pages 29 and 30 of Transcript of Testimony; also page 1 of Petitioner's Exhibit No. 1.) Mr. Gillette, however, took the quantities as classified by Mr. Updike and applied to those quantities what he considered conservative prewar prices, viz: Earth at 25 cents, earth and stone at 50 cents, and rock at \$1.25 per cubic yard; tunnel at \$6 per linear foot, lumber in flumes at \$32 per thousand feet in place; dam and intake at \$2,000, making the total cost of constructing the canal \$135,255, exclusive of overhead charges and contingencies, being an average of 46.5 cents per cubic yard of the three classes of excavation. Overhead and contingencies he placed at 25% of above total, or \$33,814, making a grand total of cost for the canal of \$169,069, exclusive of right of way, water rights, and development cost values. Included under the amount charged for overhead and contingencies are the engineering costs, business management, general and legal expenses, interest and taxes during construction, contingencies to provide for errors and omissions and incidental costs that could not be foreseen.

In so far as the unit costs applied by Mr. Gillette in this appraisal are concerned, they seem to be reasonably low by comparison of the 46.5 cents per cubic yard general average for all classes of excavation with

1912; and by comparison with the report made by Burns & McDonnell in their appraisal of the Highland Ditch, for protestants in the Reno Power, Light and Water Company case, in which they estimated cost of excavation at 30 cents per cubic yard for earth, \$1 for earth and rock, and \$2 for rock; tunnel \$6 per linear foot, and lumber in place at \$35 per thousand feet (page 28 of Burns & McDonnell report).

As to the right-of-way value, no appraisal was made, and, while some discussion was had relative to same, the records of the company do not show that anything was paid for right of way. It may be fairly assumed that right of way was given in consideration for construction of the ditch, and, while it might have a value if the ditch was being constructed now, it should not be considered in this case, owing to the fact that at least a portion of the right of way is over land owned or occupied by the water users.

Coming to the question of water-right valuation, the appraisal of same made by Mr. Gillette was largely upon the hypothesis that a duplicate supply could be secured, and estimating the cost of such duplicate system. It is not at all clear that any such supply, subject to appropriation, is available, or could be secured at any price. The alternative theory of capitalizing the difference in price between raw land without water and improved land with acquired water rights appurtenant to same, is untenable and scarcely worthy of serious consideration, as no account is taken of the time, labor, and expense necessary to reclaim the land and bring it to a state susceptible of cultivation and irrigation. No commission or court of final jurisdiction, so far as I am informed, has laid down a basis for the valuation of water rights where the water was appropriated exclusively for agricultural purposes and where the users have at least an equity right as to its use. Appropriated water is certainly valuable, but must be put to a beneficial use in order to hold same. The users of the water, in priority of use, cannot be deprived of its use upon payment of reasonable charges for the service. The question as to whom this intangible or franchise value should accrue is one the Commission will not pass upon at this time, leaving the question to the courts to determine, if necessary. The Commission will confine its findings to the physical or tangible elements of value of the property.

Under the head of development cost there are no available records from which this item can be ascertained, and it will not be considered, as this property has been in operation some thirty years, and development cost should not run continuously, but should cease after a reasonable time has elapsed for development of the enterprise.

Coming now to the expense or cost of operation of the Steamboat Canal and Irrigation Company, we find that the principal item of expense, "aside from overhead, managerial and legal expenses," is the annual maintenance and upkeep cost, consisting of cleaning the ditch at the close of the irrigation season, or before turning the water into the ditch in the spring, repairs or replacements of flumes, and upkeep of tunnels. Allowing for unusual climatic conditions during the winter season, the amount of actual labor and material necessary to maintain this ditch should not vary materially from year to year. The only

price paid for labor and the difference in the cost of materials used in maintenance and renewals. While it is not in evidence in this case, and may be given only such consideration as it would seem to warrant, it might be proper to note that in a former hearing the records show that for an eight-year period prior to 1914 the average annual operating expenses of the Steamboat Canal, at prices prevailing for labor and materials during that period, were approximately \$6,000 per annum. From 1915 on, the price of labor, material and supplies advanced rapidly up to the beginning of 1920, when the peak of prices seems to have been reached. Prices for materials and supplies, exclusive of labor, are now declining, as evidenced by the fact that common lumber, such as is used in flumes on this canal, was selling in the latter part of 1919 and the first half of 1920 at prices approximating \$60 per thousand feet; this lumber can now be purchased at \$40 to \$45 per thousand feet. Marked declines in other materials are occurring, and, while there is little prospect of prices reaching anything approaching a prewar basis for some time to come, if ever, there is evidence that they will decline from present levels. Labor as yet has shown no evidence of decline, but must eventually adjust itself to meet new conditions.

In my opinion, it would be unfair for the purposes of this case to estimate the future cost of operation upon the conditions existing prior to 1917, or upon present peak price conditions. As the cost of operation shown by the petitioners is, to a large extent, based upon estimates rather than upon actual expenditures, it would seem to be more fair to make these estimates, looking to the future, upon some average of prices between the present levels and the low point, which could reasonably be expected to maintain for some time to come.

The Commission does not look with favor upon estimates of anticipated expenditures for legal or general expenses, where actual expenses can be ascertained; believing that a more satisfactory policy is to charge all actual and legitimate expenses to the year in which they occur and can be easily checked. Many anticipated and really necessary expenditures are often not made, owing to conditions which cannot be foreseen in advance.

In the estimate of expense for the five and a half months of 1920 there is included an estimate of the cost of replacing three flumes at Roberts Creek, Alum Creek, and Hunter Creek, aggregating an estimated cost of \$3,273.50 on a basis of \$60 per thousand feet for lumber. The testimony shows that there is on hand, carried over, 23,000 feet of lumber which will be sufficient with an additional 6,000 feet, not yet purchased, to replace the flume at Roberts Creek. It appears from the record that the Roberts Creek flume should and must be rebuilt this year, but it is not at all clear that the flumes at Alum and Hunter Creeks can or will be replaced this year, as no material has as yet been purchased for this purpose. From an analysis of this item of estimated expense to be incurred for flumes this year, it appears to the Commission that the estimate of \$3,273.50 for flumes not yet built is greatly in excess of what will, in all probability, be expended; and that lumber on hand and to be purchased going to make up this estimate, at \$60 per thousand, is in excess of its cost or value; and the lumber is the

occurs is in the flumes and tunnel linings, this item can be more accurately cared for under maintenance or replacements, and charged to general operating expense when such replacements are made, and should be eliminated.

Under the head of general officers' salaries, and under the head of law expenses, it is proper to allow a reasonable charge for the time actually devoted or necessary to the keeping of accounts and general superintendence of the property during the period of active operations. There is a period of three months, however, from the 15th of December to the 15th of March, when all operations are closed for the winter, when the managerial charge might properly be eliminated, as a small property of this character should not be burdened with any overhead expense that could be avoided. It is not clear to the Commission why legal expenses incurred by the company in defense of its title to appropriated water, in suits brought by the Government, should be charged against the water users; neither is it clear that anticipated legal expenses in future contemplation should be allowed. Actual legal expenses, properly incurred and paid, might be allowed.

In a close analysis of the operating expenses, it appears to the Commission that, by prudent management, many items charged to operation might be reduced or eliminated.

Referring again to the appraisal of the property made by Mr. Gillette: The item of overhead costs and contingencies, which he places at \$33,814, or 25% of \$135,255 (the total cost of the physical property) seems to the Commission to be high, and a greater percentage than is estimated by the Commission's engineers for similar construction, it being generally placed at from 10% to 15%. There is no available data or evidence to show what the actual cost of this item was, but, as there are no difficult engineering problems encountered in the construction of this canal, it would seem that 12.5%, or \$16,906, would be a liberal estimate, and should cover the cost for this item.

Since the filing of this application for a new schedule of rates, and prior to the hearing on same, the canal company entered into an agreement with certain users of water on the upper or western end of the canal, granting an easement, or right to flow some 400 inches of water through the canal, for which easement or right the users paid the canal company \$26,000 and in addition are to pay the sum of two (\$2) dollars per inch annual maintenance charge for the first two years, and one dollar and fifty cents (\$1.50) per inch per annum thereafter. Interest on the \$26,000 received for this easement, and the \$2 per inch annual maintenance charge on 400 inches of water, should be credited to operating income.

Considerable testimony was introduced by protestants purporting to show that many of the water users could not operate at a profit under existing conditions, charges for water, and prices secured for the products of their ranches. This testimony by the different users of water, however, was conflicting, vague, and indeterminate, for the reason that their accounts were more or less loosely kept, and did not show with any degree of certainty what their actual income and operating expenses properly assigned were. After charging for all

labor of the owners and their wives, and all additional labor, rentals, household expenses for board and supplies, operating expenses and improvements, including rental for water, some protestants sought to show that, after allowing for all of the above charges, they about broke even or operated at some loss, and did not get a return on the fair or sale value of their land. Others testifying to the same material facts, using the same methods of accounting, showed a substantial margin of profit over and above their operating expenses.

On the question of operating expenses and net returns it was stipulated by counsel that the testimony of Mr. Laughton, before Judge Moran, in a case now pending in his court, would be considered as in evidence in this proceeding. (See Transcript of Testimony, pages 144-146.)

All the testimony going to this feature of the case merely shows that, while some operated their ranches at a very substantial profit, others were unable to show the same results, which is true in all lines of human endeavor, and the charge for water, being only an element of the total expense, would have little or no effect upon the general result.

The canal company is now supplying approximately 2,100 inches of water to approximately 4,000 acres of land, or an average of one-half inch per acre, some using more and others slightly less, depending upon the character of the soil and the tracts irrigated. It might be noted in the actual and estimated expense for flume replacements that these flumes when replaced stand for a long period of years with little or no additional expense, and should be prorated over their probable life period.

In summing up, from the foregoing analysis, I am of the opinion that the fair value of the Steamboat Canal and Irrigation Company's property—physical and tangible—used and useful in rendering service to the water users, is \$152,161; that the *average* yearly operating expenses, looking to the future, under prudent and economical management, should not exceed the sum of \$9,600, which is 60% increase over the average for the eight-year period prior to 1914; that the rate of fourteen dollars (\$14) per inch, as applied for, is excessive and more than the users can reasonably pay, *and should be denied*; that a rate of nine dollars (\$9) per inch will give a fair return upon the property, after allowing for all necessary operating expenses, as illustrated by the following table, and will not place any undue burden upon the consumers, being an average of four dollars and fifty cents (\$4.50) per acre for acreage irrigated:

2,100 inches at \$9 per inch.....	\$18,900.00
Interest on \$26,000 received for easement at 8%.....	2,080.00
Maintenance credit 400 inches at \$2 per inch.....	800.00
<hr/>	
Total operating income.....	\$21,780.00
Less operating expenses.....	9,000.00
<hr/>	
Net operating revenue.....	\$12,780.00
Or 8% on \$152,161 value of the property.	

The Steamboat Canal and Irrigation Company may make and file with the Commission, subject to approval by the Commission, such rules and regulations relating to time of payment of water rentals, discounts for advance payment, and such other rules as may be reasonable or necessary for the conduct of the business.

An order conforming to the foregoing opinion should be entered.

ORDER

At a general session of the Public Service Commission of Nevada, held at its offices in Carson City, Nevada, on the 27th day of November, 1920:

Present—Chairman J. F. Shaughnessy, Commissioners W. H. Simmons and J. G. Scrugham, and Secretary Benson Wright.

Pursuant to the foregoing opinion, it is hereby

ORDERED, That the rate of fourteen dollars (\$14) per inch filed with this Commission by the Steamboat Canal Company for irrigation service for the season of 1920 is hereby disapproved, and the application thereof denied, on the ground that it is unjust, unreasonable, and excessive; and it is further

ORDERED, That the Steamboat Canal Company shall file with this Commission a rate of \$9 per inch, which is hereby found to be the just and reasonable rate to be charged for irrigation service for the irrigating season of 1920 and each succeeding year, or until changed or modified by this Commission.

BY THE COMMISSION,

BENSON WRIGHT, *Secretary*.

Dated November 29, 1920.



CARSON CITY, NEVADA

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1920

THE UNIVERSITY OF NEVADA
AGRICULTURAL EXPERIMENT STATION

S. B. DOTEN, Director

Bulletin No. 99

RENO, NEVADA

December, 1920

To diminish suffering and loss among domestic animals

THE NARROW-LEAVED MILKWEED

(*Asclepias Mexicana*)

and

THE BROAD-LEAVED OR SHOWY MILKWEED

(*Asclepias speciosa*)

PLANTS POISONOUS TO LIVE STOCK IN NEVADA

By

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Of the Department of Range Management

Assisted by

M. R. MILLER
Of the Department of Chemistry

and

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Of the Department of Veterinary Science

PUBLISHED BY THE UNIVERSITY OF NEVADA
RENO, NEVADA



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CARSON CITY, NEVADA

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STUDIES OF POISONOUS PLANTS IN THE UNIVERSITY OF NEVADA

In recent years, as the forage on the open public range in Nevada has become more and more depleted, losses of sheep and cattle from poisonous plants have steadily increased. However, even the stockmen and herders themselves do not know fully just which plants are poisonous nor how to avoid them.

The Nevada Agricultural Experiment Station has therefore undertaken a study of the poisonous plants of the sheep and cattle ranges. The experimental work is of a simple character, consisting largely of practical feeding tests. The plants are brought to the University fresh from the ranges and are fed to common range live stock in small corrals. The symptoms of poisoning are recorded; and after the death of the animal the carcass is cut up and the organs are removed and studied.

An attempt is also made to isolate the active poisonous principle of the plant by suitable chemical methods and to determine its chemical nature.

These experiments are showing clearly which range plants are dangerous, what part of the plant is poisonous, and at what season of the year it must be avoided. They are also showing us that many suspected plants are harmless, while others which are considered harmless are in reality deadly.

In all these experiments it is our purpose first to obtain exact information concerning the poisonous range plants and then to spread it far and wide among the stockmen of the West in the hope of diminishing suffering and loss among western sheep and cattle.

S. B. DOTEN,

Director, Nevada Agricultural Experiment Station.

November 1, 1920.

SECTION I

The Milkweeds as Plants Poisonous to Live Stock in Nevada

SUMMARY

(1) There are two common milkweeds in Nevada, both of which are poisonous to sheep and cattle.

(2) One is a slender, erect, branching weed with long, narrow, dark-green leaves, small flowers, and slender pods. The other is a tall and fleshy weed with large, broad, light-green leaves, coarse flowers, and thick rough pods.

(3) Both kinds grow in fairly moist places, along irrigation ditches, by fences and on stream banks, on roadsides, and in patches in damp pastures.

(4) In the autumn the pods break open and release quantities of flat brown seeds, each of which bears a tuft of shining silky hairs, lighter than thistledown. The seeds are carried far by wind and water. Once established, the plant spreads locally by means of its underground stems.

(5) Animals poisoned by the narrow-leaved milkweed become dull and stupid within a few hours. They walk about with a wobbling, unsteady gait, finally losing all control over the muscles of the legs, and falling or lying down. After the animal is down, it has spasms at short intervals in which the legs are extended rigidly. The heart beats at an increasingly rapid rate; the animal pants and grunts. The head is drawn sharply back. The attack may last for twenty-four hours and end with either the death or the recovery of the animal. If it recovers, it will be in a weak and unsteady condition for several days.

(6) Animals poisoned by the broad-leaved or showy milkweed stop eating, grow dull, and lie down; the breathing is irregular, difficult, and grunting. There are no spasms. The breathing becomes more difficult, and the animal dies quietly.

(7) The narrow-leaved milkweed is far more deadly than the broad-leaved or showy species.

(8) Two or three other milkweeds grow in Nevada; but they are neither common enough nor poisonous enough to be of any importance.

(9) When the narrow-leaved milkweed is accidentally cut and cured in hay, it loses its bad flavor, but keeps its deadly character, thus becoming far more dangerous than when fresh and green. Even the dead and dried leaves, left standing in a field from the summer before, are poisonous in midwinter.

(10) It is a costly and difficult matter to get rid of the narrow-leaved milkweed on even a small piece of ground. If a bit of the underground stem is left in the soil, it will soon produce a new plant.

(11) Both of our poisonous milkweeds have so unpleasant a flavor that neither sheep nor cattle will eat them except when they are very hungry and there is practically nothing else in the field for them to eat.

(12) Poisoning may be prevented by keeping hungry animals and animals in poor condition away from milkweed patches, and by stocking pastures lightly enough to keep the animals constantly provided with other food.



Figure 1—Flowers and Pods of the Narrow-Leaved Milkweed.

OUR WESTERN MILKWEEDS

For many years several kinds of milkweed have been looked upon with suspicion or considered poisonous by western stockmen. This opinion was based largely on their own field observations; and little or no experimental work has been done with any of the species except the whorled-leaved milkweed (*Asclepias galioides*). The latter plant has been carefully studied by the Colorado Experiment Station, which was the first of the western stations to show that sheep may be poisoned by this plant when it is eaten either green or dry. (See Bulletins 246 and 255, Colorado Agricultural Experiment Station.) Later, C. D. Marsh and his associates of the Federal Bureau of Plant Industry published the results of their study of the same species. (See Bulletin No. 800, U. S. Department of Agriculture.)

In the spring of 1918 the attention of the Nevada Experiment Station was first called to our local milkweeds as plants dangerous to live stock when several lambs died after eating the tender, juicy young growth of the showy milkweed (Fig. 4). Since that time the Nevada Station has tested the milkweeds by conducting a long series of experiments in which the plants were fed to both sheep and cattle. More work was done with the narrow-leaved milkweed than with any of the others because it seemed to be our most dangerous species. The result of these feeding tests, together with field observations, are presented in this bulletin.

Classes of Live Stock Poisoned and the Extent of Losses in this State and Elsewhere.

Both feeding tests and field observations have shown that the narrow-leaved milkweed (*Asclepias Mexicana*) is poisonous to sheep and cattle. No feedings of any species of milkweed have been made to horses because there seems to be nothing to show that horses have been poisoned by these plants.

Because of the limited time since the milkweeds were recognized as poisonous to live stock in Nevada, the extent of losses cannot be accurately estimated. Further, unless especially large losses take place, they are usually not reported to the Experiment Station. However, because of the widespread distribution of the narrow-leaved milkweed and the ease with which it kills, it is reasonable to assume that losses of live stock, at least in small numbers, are constantly caused by this common poisonous plant.

In other States, notably Colorado, Utah, and New Mexico, it has been proven that the whorled-leaved milkweed has caused the death of many sheep.

Kinds of Milkweed Dangerous to Live Stock in Nevada.

Several kinds of milkweed grow in Nevada but, from the stockman's point of view, the narrow-leaved species is by far the most important. The other kinds will be discussed briefly toward the end of this bulletin. They are: the Showy Leaved Milkweed (*Asclepias speciosa*); the Heart-Leaved Milkweed (*Asclepias cordifolia*); and the Prostrate Milkweed (*Asclepias cryptoceras*). Our experiments seem to show that the heart-leaved and prostrate milkweeds are not poisonous enough or common enough to be dangerous on the range or in pastures in Nevada.

General Description of the Milkweeds.

The milkweeds are usually erect plants, little if at all branched, varying in height from one to several feet. The roots live over from year to year, sending up new stems each season. The flowers are light-colored, white tinged with green or pink; they grow in rounded clusters, each flower stalk arising from the end of the stalk of the cluster.



Figure 2—Pods and Seeds of the Narrow-Leaved Milkweed.

Each flower has five cup-like structures (hoods), inside of which there is a horn.

The flowers fall and are followed by seed pods from one to three inches long which open along one side when dry to allow the seeds to escape. The seeds are reddish-brown and flat; on one end there is

a tuft of long, white, silky hairs by which they are blown about. The roots of the milkweeds are somewhat brittle, whitish and thickened; this is especially true of the showy milkweed (Fig. 4). The growth of the root is mainly horizontal, as is shown in Fig. 5—The Root of the Narrow-Leaved Milkweed. Sometimes, however, the roots penetrate the soil like the roots of alfalfa.

The milkweeds have a milky sap or juice which gives to them their common name and distinguishes them from most other plants. However, a milky sap is found in many other plants, such as the Mexican poppy, the dandelion and its close relatives, the wild lettuce, spurges, and dog-banes. From all these plants having a milky juice, the milkweeds may be distinguished by the following differences: (1) the Mexican poppy is spiny, while the milkweeds are not; (2) the dandelion and its near relatives have no erect stem, while the milkweeds have; (3) the general appearance of the wild lettuce is quite different from the milkweeds and its flower and flower clusters (heads) are like tiny dandelions and not at all like the flower or flower clusters of the milkweed; (4) the spurges (*Euphorbia*) are mostly low, branching plants with small leaves, the two halves of which are different in shape and size; (5) some of the dog-banes might easily be mistaken for the narrow-leaved milkweed, but they branch more freely and tend to be bushy, at least toward the top. Their flowers are not scattered in dense clusters and do not have hoods as in the milkweed. The pods are similar to those of the milkweed but more slender; the seeds are also similar but smaller and not so flattened.

How to Distinguish the Narrow-Leaved Milkweed from the Showy Milkweed.

The showy-leaved milkweed is quite abundant in Nevada, but it is not nearly so poisonous as the milkweed with the long narrow leaves. The two are easily distinguished by the following differences: (1) the narrow-leaved milkweed has several leaves at each joint of the stem, while the shown species has but two; (2) the leaves of the showy milkweed are much broader, from one-third to one-half as broad as they are long; (3) the narrow-leaved milkweed has smooth pods, while the showy species has pods roughened by projections. Figures 3 and 4 show the general appearance and characteristics of these two plants.

Where the Milkweeds Grow.

The milkweeds are widely distributed in Nevada. They require fairly wet soil, and do not grow on the drier parts of the range. They are common along irrigation ditches and streams, along roadsides, and in pastures and washes and idle lands which have not been cultivated for a number of years. In such locations the narrow-leaved kind is more abundant. It has a wider distribution than the showy milkweed or any of the other species found in this State.

The milkweeds usually grow in full sunlight, although they may be found in partly shaded places as in orchards and among willows and cottonwoods along streams.

In several places in Nevada the narrow-leaved milkweed has been reported to be getting more abundant. Especially is this true along the banks of irrigation ditches. Wherever irrigation systems have been extended to new ground, this poisonous weed soon grows abundantly along the ditch banks.



Figure 3—The Narrow-Leaved Milkweed.



Figure 4—The Broad-Leaved or Showy Milkweed.

All our observations indicate that after it is once established the narrow-leaved milkweed tends to remain confined to the ditch banks and adjoining moist areas. There seems to be little danger of its establishing itself throughout the alfalfa fields and meadow hay lands to such an extent that it would cause the hay to be discriminated against for feeding purposes.

How the Milkweeds Spread.

The milkweeds produce quantities of flat brown seeds, each of which bears a tuft of shining silky hair by means of which it floats on the wind and is carried to considerable distances. Often they are blown into irrigation ditches and carried to distant fields by the water.

New patches may start from seeds, or from pieces of roots carried by plows and other farm implements or picked up by the water and transported to new areas.

Where the plant has become established, the size of the patch is usually increased by the shallow horizontal underground stems which give rise to new plants.

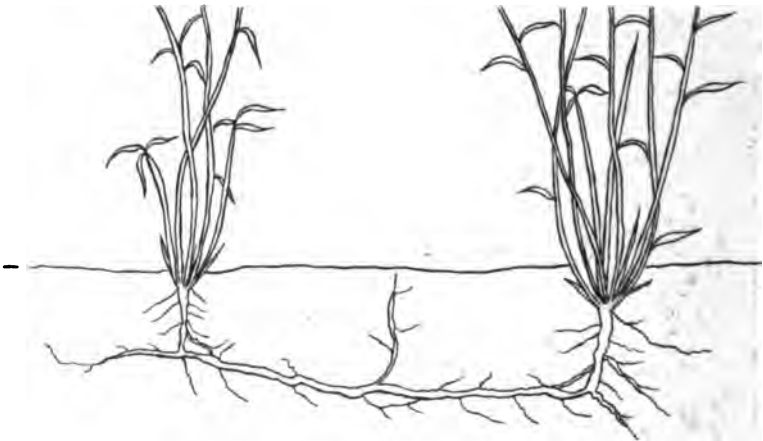


Figure 5—Root of the Narrow-Leaved Milkweed.

It is not uncommon for the same root system to connect up a large number of plants, all of which were produced by the spreading horizontal roots of a mother plant. Thus when it once becomes established it is indeed hard to get rid of this poisonous weed because of the budding of the roots. In some of the milkweeds such buds are known to form as much as two feet below the surface of the ground; and a two-inch piece of the root of the common milkweed was found by A. S. Hitchcock in Kansas to be able to form a new plant. On small areas in Nevada the narrow-leaved milkweed has been dug and pulled two or three times during the season without completely eradicating the plant, because of its ability to produce new plants from small pieces of root left in the soil. Thus any means by which the root is broken up into small pieces and left in the ground will enable the plant to maintain itself and in some instances actually to increase.

THE NARROW-LEAVED MILKWEED (*Asclepias Mexicana*)

The Part of the Plant Which Is Poisonous.

In our experiments we have fed the whole top of the plant, stems, leaves, and sometimes flowers and seed pods. A few feedings were made of leaves only, and these few tests seem to indicate that the leaves are the most poisonous part of the plant. The pods appear to be less poisonous than either the leaves or the stem. Feeding of seeds alone produced no symptoms. This indicates that the plant is not more dangerous, but perhaps less so, when it is full of seed pods than at other times. For all practical purposes the entire plant may be considered poisonous.

The Time of the Year When It Is Poisonous.

So far as known the narrow-leaved milkweed is poisonous at all stages of growth. Our tests showed it to be poisonous when fed (1) in a green condition, (2) after being cut and dried as hay, and (3) as it dries naturally in the field in the fall. Thus in all stages it is poisonous; and hay containing any large amount of this plant may be regarded as extremely dangerous.

Amount Necessary to Make Sick or to Kill.

We fed the narrow-leaved milkweed to cattle and sheep, (1) in a fresh green state, (2) after being cut and dried, and (3) as it cured naturally on the stems in the fall, (4) the pods alone, and (5) the seeds alone.

TABLE I
The Narrow-Leaved Milkweed—The Fresh Green Plant Fed to Sheep

Animal No.	Weight lbs.	Date fed	Time fed	Amount fed, lbs.	Time symptoms observed	Time of death or recovery	Final result
2	120	5-31-18	2:25 p. m.	1			Negative
28	63	5-31-18	2:30 p. m.	1			Negative
18	95	6- 8-18	4:00 p. m.	1			Negative
25	93	6- 8-18	4:05 p. m.	1	6- 9-7:15 a. m.	6- 9-6:00 p. m.	Recovery
74	98	8-12-20	4:05 p. m.	1			Negative
75	90	8-12-20	4:10 p. m.	1			Negative
78	87	8-12-20	4:15 p. m.	1	8-13-7:00 a. m.	8-15-8:00 a. m.	Recovery
72	93	8-12-20	4:40 p. m.	1	8-13-8:00 a. m.	8-14-8:00 a. m.	Recovery
19	68	5-29-18	4:10 p. m.	1	5-30-9:00 a. m.	5-31-8:30 a. m.	Recovery
8	72	5-31-18	2:40 p. m.	1	6- 1-9:00 a. m.	6- 2-9:00 a. m.	Recovery
79	95	8-11-20	4:10 p. m.	1	8-12-8:00 a. m.	8-13-7:00 a. m.	Recovery
8	100	8-12-20	4:20 p. m.	1	8-13-6:00 p. m.	8-14-6:00 a. m.	Recovery
6	65	5-31-18	2:45 p. m.	1	6- 1-8:00 a. m.	6- 1-4:45 p. m.	Death
77	88	8-12-20	4:30 p. m.	1	8-13-7:00 a. m.	8-15-8:00 p. m.	Recovery
17	61	5-29-18	4:10 p. m.	2	6:00 p. m.	Before 9:00 p. m.	Death

The animals were not watched during the night, usually the first observation being made at 8 o'clock in the morning. This is the reason why, in this and the following tables, under the caption Time of Death or Recovery, "8:00 a. m." appears so often. It records the condition of the animal at the first observation made in the morning.

The tests summarized in this table indicate that (1) if common range ewes eat one-half pound or less no serious trouble will follow; (2) amounts in excess of one-half pound and up to 1½ pounds will usually make the animal sick, but it will recover; (3) amounts of 1½ pounds or more are quite likely to cause death.



Figure 6—Sheep Poisoned by Narrow-Leaved Milkweed.



Figure 7—Sheep Poisoned by Narrow-Leaved Milkweed.

TABLE II
The Narrow-Leaved Milkweed—The Air-Dried Plant Fed to Sheep

Animal No.	Weight lbs.	Date fed	Time fed	Amount fed, ozs.	Time symptoms observed	Time of death or recovery	Final result
56.....	111	10-17-19	8:20 a. m.	3			Negative
37.....	90	10-17-19	10:30 a. m.	3			Negative
59.....	100	10-17-19	8:40 a. m.	4	10-18—8:00 a. m.	10-23—8:00 a. m.	Recovery
56.....	111	10-21-19	11:30 a. m.	4			Negative
55.....	112	10-17-19	11:45 a. m.	5	10-18—8:00 a. m.	10-19—8:00 a. m.	Recovery
57.....	112	10-21-19	11:00 a. m.	5	10-22—8:00 a. m.	10-24—8:00 a. m.	Recovery
46.....	80	10-20-18	9:30 a. m.	5	10-20—2:00 p. m.	10-23—8:00 a. m.	Recovery
8.....	100	8-24-20	2:50 a. m.	6	8-26—8:00 a. m.	8-26—8:00 a. m.	Recovery
72.....	85	8-25-20	2:20 a. m.	7	Not observed	8-26—8:00 a. m.	Death
45.....	85	11-26-18	10:00 a. m.	8	11-20—2:00 p. m.	11-21—2:45 p. m.	Death

After the green plant has been thoroughly dried in the sun it loses approximately 65% (two-thirds) of its original weight. Its condition is then much the same as it would be if cut and cured in hay. In the feeding tests the air-dried material was in most instances mixed with alfalfa hay and fed.

The feedings of hay and milkweed may be briefly summed up for range ewes as follows: (1) 3 ounces may or may not make the animal sick, (2) 4 to 6 ounces will usually produce poisoning, (3) amounts in excess of 6 ounces will probably cause death.

The dried milkweed is evidently very poisonous. While the plant is green sheep are very likely to avoid it because the taste is repellent; but after it is dry it loses much of its bad flavor and is then more dangerous because more readily eaten.

It takes about three parts of fresh milkweed to make one part of air-dried; and it is an interesting fact that if the above amounts of air-dried material are multiplied by 3 to give the original green weight they agree very closely in most cases with the results of Table I.

The feeding tests given in Table II therefore indicate that drying causes little if any loss of the poisonous principle. Consequently when this milkweed is cut and fed in hay, it becomes a serious source of danger.

TABLE III

The Narrow-Leaved Milkweed—The Plant Which Had Dried Naturally in the Field Fed to Sheep

Animal No.	Weight lbs.	Date fed	Time fed	Amount fed, lbs.	Time symptoms observed	Time of death or recovery	Final result
48-----	85	11-12-19	2:30 p. m.	$\frac{3}{4}$	-----	-----	Negative
58-----	115	11-29-19	1:50 p. m.	$\frac{1}{2}$	11-30-8:00 a. m.	12-2-8:00 a. m.	Recovery
43-----	80	12-9-19	9:00 a. m.	$\frac{1}{2}$	12-9-2:45 p. m.	12-10-8:00 a. m.	Recovery
45-----	84	12-16-18	10:45 a. m.	$\frac{1}{2}$	12-17-8:00 a. m.	12-18-8:00 a. m.	Recovery
43-----	80	12-26-18	11:30 a. m.	1	12-27-8:00 a. m.	12-30-8:00 a. m.	Recovery
43-----	80	1-2-19	2:00 p. m.	$1\frac{1}{2}$	1-2-8:00 p. m.	1-3-8:00 p. m.	Death

The plants which were used in the above feeding tests were collected in late autumn after they had fully matured and become dry. The feedings were made in the months of November, December, and January. The results may be summed up briefly as follows: (1) small amounts up to 3 ounces are not dangerous, (2) amounts from 5 to 16 ounces will usually produce poisoning, (3) amounts in excess of 16 ounces are extremely dangerous, and are likely to cause death.

Comparing the results given in Table I with those of Table III, it is found that it takes about as much of the naturally cured material, dry weight, to cause death as of the fresh green plant. From this it appears that some of the poison is destroyed or lost when the dried plant stands exposed to snow and rain after the leaves are dead.

During the fall and winter months the dried plants may be found still standing. Other feed is usually very short and scarce at that time of the year; and the narrow-leaved milkweed, still retaining a considerable part of its original poison, is then a source of danger to grazing animals.

TABLE IV

The Narrow-Leaved Milkweed—Seeds Fed to Sheep

Animal No.	Weight lbs.	Date fed	Time fed	Amount fed, ozs.	Time symptoms observed	Time of death or recovery	Final result
58-----	98	9-7-19	3:30 p. m.	2	-----	-----	Negative
59-----	101	9-7-19	3:40 p. m.	5	-----	-----	Negative

In late summer and early fall the narrow-leaved milkweed has a large number of seeds and pods.



Figure 8—The First Symptoms of Poisoning by Narrow-Leaved Milkweed.

In previous feeding tests the pods and seeds of the showy milkweed were found to be the most poisonous part of the plant; so it was thought that this might also be true of the narrow-leaved milkweed. Two feedings of seeds were made, one of 2 ounces and the other of 5 ounces. Neither animal was poisoned. The quantity of seed which we fed in either test represents the seed production from a large number of plants, a number in excess of what it is believed any animal would be able to get within a reasonable length of time. Con-

sequently it seems that the danger of poisoning from these seeds is very slight and that such poisoning is highly improbable.

TABLE V
The Narrow-Leaved Milkweed—Green Pods Fed to Sheep

Animal No.	Weight lbs.	Date fed	Time fed	Amount fed, lbs	Time symptoms observed	Time of death or recovery	Final result
73.....	77	8-17-20	4:20 p. m.	1	.....	.....	Negative
74.....	98	8-17-20	4:35 p. m.	1	.....	.....	Negative
8.....	100	8-17-20	4:50 p. m.	2	.....	.....	Negative
69.....	80	8-19-20	7:40 a. m.	2½	8-20—7:00 a. m.	8-22—8:00 a. m.	Recovery
8.....	100	8-19-20	7:30 a. m.	3½	.....	.....	Negative

Five feedings of green pods were made, using amounts of from one-half to 3½ pounds. None of these feedings caused poisoning with the exception of one 2½-pound feeding. These tests indicate that the pods are less poisonous than the leaves and stems, and that the danger of loss is smaller when the plant is full of pods.

TABLE VI
The Narrow-Leaved Milkweed—The Dried Plant Fed on Successive Days to Sheep

Animal No.	Weight lbs.	Date fed	Time fed	Amount fed, ozs.	Time symptoms observed	Time of death or recovery	Final result
37.....	85	10-21-19	11:45 a. m.	2	.....	.....	Negative
		10-22-19	11:15 a. m.	2	.....	.....	Negative
		10-23-19	10:30 a. m.	2	.....	.....	Negative
		10-24-19	10:00 a. m.	2	.....	.....	Negative
		10-25-19	7:30 a. m.	2	.....	.....	Negative
		10-26-19	11:00 a. m.	2	.....	.....	Negative
		10-27-19	8:30 a. m.	3	.....	.....	Negative
		10-28-19	10:00 a. m.	3	.....	.....	Negative
		10-29-19	10:00 a. m.	4	.....	.....	Negative
		10-31-19	11:30 a. m.	5	11- 2—7:00 a. m.	11- 3—8:00 a. m.	Recovery

Dry material collected September 6. Sheep never very sick.

59.....	93	10-27-19	11:10 a. m.	2	.....	.....	Negative
		10-28-19	8:30 a. m.	2	.....	.....	Negative
		10-29-19	11:00 a. m.	4	.....	.....	Negative
		10-31-19	10:30 a. m.	4	10-31—2:00 p. m.	11- 2—7:30 a. m.	Recovery

Dry material collected September 6. Sheep only slightly sick.

TABLE VI—*Continued*

Animal No.	Weight lbs.	Date fed	Time fed	Amount fed, ozs.	Time symptoms observed	Time of death or recovery	Final result
59-----	90	11- 9-19	10:30 a. m.	6	11- 3-5:00 p. m.	11- 6-8:00 a. m.	-----Recovery
		11- 9-19	11:30 a. m.	7	11- 9-7:00 a. m.	11-10-8:00 a. m.	-----Recovery
		11-12-19	2:00 p. m.	6	11-15 (dull)	11-15-8:00 a. m.	-----Recovery
Material collected as it had dried in the field. Sheep quite sick.							
10a----	100	7-21-19	9:00 a. m.	2	7-22-12 m.	7-23-10:00 a. m.	-----Death
		7-22-19	10:25 a. m.	2			
120-----	95	7-21-19	9:30 a. m.	2			
		7-22-19	10:25 a. m.	2	-----	-----	-----Negative

When animals are poisoned with the narrow-leaved milkweed they are affected for a considerable time, the poison appearing to be eliminated slowly. Because of this slow recovery it was thought that small amounts fed daily might cause an accumulation of the poisonous principle in the animal.

Ewe 37 was fed daily 2 ounces of sun-dried milkweed for six days without showing any symptoms of poisoning. The dose was then increased to 3 ounces for two days. On the following day, 4 ounces were fed without causing any symptoms, and two days later she was fed 5 ounces and became only slightly sick. During the ten-day period she had been fed a total of 27 ounces; yet it was only on the last day, when she was fed 5 ounces, that she showed any signs of poisoning. In all the tests summarized in Table II the feedings of 5 ounces produced symptoms of poisoning. These successive feeding tests of Table VI indicate very clearly that there is little if any cumulative action when the milkweed is fed at brief intervals.

Sheep 59, which had been made very sick with 4 ounces in an earlier experiment, was fed 2 ounces daily for two days; then 4 ounces were fed without producing any symptoms. Two days later, when again fed 4 ounces, this animal was made slightly sick. This feeding test also indicates that there is no cumulative action when small doses are fed on consecutive days.

Three days later, on November 3, Sheep 59, the same animal as mentioned above, was fed 6 ounces of the sun-dried milkweed, which made it quite sick. Five days later it was fed 7 ounces and again it developed symptoms of poisoning. Finally, on November 12, four days later, 7 ounces were fed, the animal again becoming slightly sick. Each of these feedings made the animal sick, but not nearly so sick as the original 4 ounces. The last three feedings were made with a different lot of milkweed material which may have been less poisonous; although when 5 ounces of this lot was fed to another ewe it made her sick for two days.

Animal 10a died when given the second feeding of 2 ounces. This case can hardly be considered as at all typical because the animal was found to have a badly diseased kidney which may have retarded the elimination of the poison and hastened death.

Sheep 120, when fed the same amounts and in a similar way as Sheep 10a, developed no poisoning symptoms and to all outward appearances was normal.

These tests prove rather clearly that there is no cumulative action of the poisonous principle in sheep. The same, it is believed, will hold true for other animals. Rather, they seem to show that there is a

tendency to develop tolerance for the poison. It may be that the slow recovery is due more to the slowness with which the nervous system recovers from the action of the poison than to the poison being retained in the system.

TABLE VII
The Narrow-Leaved Milkweed—The Green Plant Fed to Cattle

Animal No.	Weight lbs.	Date fed	Time fed	Amount fed, lbs.	Time symptoms observed	Time of death or recovery	Final result
15.....	260	8-11-20	8:00 a. m.	1	-----	-----	Negative
19.....	270	8-14-20	11:10 a. m.	1½	-----	-----	Negative
15.....	260	8-13-20	4:15 p. m.	2	-----	-----	Negative
19.....	270	8-16-20	2:50 p. m.	2½	8-17—7:00 a. m.	8-17—11:40 a. m.	Death
20.....	320	8-14-20	2:30 p. m.	3	8-15—8:00 a. m.	8-15—8:00 a. m.	Recovery
9.....	225	8-9-19	10:00 a. m.	3½	8-10—8:00 a. m.	8-11—4:00 p. m.	Recovery
888.....	211	7-23-19	8:30-11:30	4½	7-23—1:00 p. m.	7-25—8:00 a. m.	Recovery
7.....	195	8-12-19	4:00 p. m.	5	8-12—10:00 p. m.	8-13—10:00 a. m.	Death

The foregoing table made from tests with yearling animals may be briefly summarized for a stockman's use as follows: (1) amounts below 2 pounds are not ordinarily dangerous; (2) amounts in excess of 2 pounds and up to 5 pounds are dangerous; (3) amounts of 5 pounds or more may be reasonably certain of causing death; (4) there is a wide variation in the susceptibility of individual animals, some being poisoned with less amounts than others.

TABLE VIII
The Narrow-Leaved Milkweed—The Green Pods Fed to Cattle

Animal No.	Weight lbs.	Date fed	Time fed	Amount fed, lbs.	Time symptoms observed	Time of death or recovery	Final result
15.....	260	8-16-20	1:45 p. m.	2½	-----	-----	Negative

This one feeding showed very clearly from the view-point of a stockman that there is no increased danger from an animal eating pods, for (1) it takes a large number of the plans to produce 2½ pounds of pods, a greater number than any animal would graze in any one time; and (2) if 2½ pounds produce no symptoms of poisoning, it is plain that the pods are not especially poisonous.

The following table summarizes the feeding of air-dried narrow-leaved milkweed to cattle. This material was cut green and allowed to dry thoroughly in the sun; the weight when dry being approximately 66% less than the green weight:

TABLE IX
The Narrow-Leaved Milkweed—The Air-Dried Plant Fed to Cattle

Animal No.	Weight lbs.	Date fed	Time fed	Amount fed, lbs.	Time symptoms observed	Time of death or recovery	Final result
48.....	272	9-24-20	10:00 a. m.	½	-----	-----	Negative
15.....	260	8-25-20	1:00 p. m.	½	-----	-----	Negative
49.....	298	9-15-20	9:00 a. m.	½	-----	-----	Recovery
15.....	260	6-15-20	8:00 a. m.	½	9-16—4:30 p. m.	9-17—8:00 a. m.	Recovery
8.....	225	10-16-19	4-6 p. m.	½	6-15—2:30 p. m.	6-16—8:00 a. m.	Recovery
17.....	345	6-16-20	10:00 a. m.	½	10-17—8:00 a. m.	10-17—11:00 p. m.	Death
18.....	220	7-21-20	5:00 p. m.	½	6-17—8:00 a. m.	6-18—8:00 a. m.	Recovery
31.....	280	6-14-20	11:30 a. m.	3	7-22—8:00 a. m.	7-23—7:00 a. m.	Death
					6-14—7:00 p. m.	6-15—7:00 a. m.	Death

For the practical purposes of the livestock business the following conclusions may be drawn from this table for yearling animals weighing around 250 pounds: (1) small amounts of one-fourth pound or less are practically harmless; (2) amounts of one-half pound are dangerous but not fatal; (3) amounts of three-fourths of a pound will either kill the animal or make it very sick; (4) all amounts in excess of three-fourths of a pound are highly dangerous.

Animal 31, through a mistake, was fed 3 pounds of the dried plant mixed with alfalfa. The animal ate this very greedily. This shows that an animal will readily eat much more than a fatal dose of the dry milkweed, especially if it is mixed with a palatable feed such as alfalfa hay. When the plant is dried, it does not lose its poisonous character, but apparently does lose its bad flavor and becomes much more attractive to both sheep and cattle.

SYMPTOMS OF MILKWEED POISONING

The first symptom noted in sheep is extreme dullness or entire loss of appetite. In as sluggish an animal as a sheep this abnormal dullness is often difficult to detect, and some of the tests recorded as negative may have had this symptom. In several cases there was a distinct trembling over the entire body accompanied by salivation. The next symptom to appear was a wobbly unsteady gait, first noticeable in the hind legs. In several cases this became worse until the animal staggered and was hardly able to walk, sometimes falling over.

In extreme cases this would be followed by a stage where the animal was down and unable to get up. Some of the animals while down were in a comatose stage as if asleep or in deep stupor.

In the fatal cases there was a series of spasms while the animal was down, much resembling the symptoms of water hemlock (poison parsnip, *Cicuta*) poisoning. While



**Figure 9—Calf Poisoned by Narrow-
Leaved Milkweed.**

in this condition the eyes were staring and bleared, the pupils dilated. The head was drawn far back; in many cases there was champing of the jaws and grating of the teeth, with rapid running or kicking movements of both the hind and front legs, followed by spells when the legs would be extended and rigid. Any disturbance of the animal then brought on additional spasms, attended frequently by bleating grunts or groans. In all fatal cases the spasms occurred at irregular intervals until death, spasms becoming weaker and of shorter duration with a longer interval between them.

In nonfatal cases the symptoms during recovery were as follows: If the animal had been down, it would get up but be hardly able to walk, often falling down in its attempt to keep on its feet. As the animal began to get better it would walk with a distinctly unsteady gait and would sometimes refuse to eat for a considerable length of time. Some would eat while still hardly able to walk. The symptoms would disappear so gradually that it would often be very difficult to say definitely when the animals had recovered, just as it was hard to tell when they began to get sick.

The sheep that died were sick from five to twenty-four hours. Those that recovered were sick from twelve to seventy-two hours, most cases from twelve to forty-eight hours. Cattle showed practically the same series of symptoms as did sheep. Those that died were sick twelve to fifteen hours, and those that recovered were sick eighteen to forty-two hours.

Typical Cases

Case No. 1—A sheep weighing 100 pounds was fed 4 ounces of air-dried leaves at 8:40 a. m. on November 17, 1919. The following morning at 8 a. m. she was sick and walked with an unsteady gait. At 2 p. m. she was much worse and was hardly able to get up. By 6 o'clock she was down and unable to rise. She lay flat on her side and appeared to be in a deep stupor until 2 p. m. of the 20th, when she got up, but walked with a very unsteady gait and appeared to have imperfect control of the muscles of one hind leg. She was so weak that she fell down, but soon got up again. Next morning she appeared normal, except that she limped on one hind leg.

Case No. 2—An ewe weighing 115 pounds was fed 5 ounces of air-dried material at 11 a. m. on October 21, 1919. By midnight no symptoms had appeared. At 8 o'clock next morning she was sick and scarcely able to walk. By 11 a. m. she was down and was hardly able to get up. At 9 p. m. she was still sick, and the following day she staggered around when she walked. Next morning, October 23, she appeared to have practically recovered.

Case No. 3—A ewe weighing 85 pounds was fed 8 ounces of dry leaves at 10 a. m. on November 20, 1919. At 2 p. m. she was drooling freely and not eating. By 4:30 p. m. she walked with an unsteady gait, this being especially noticeable in the hind quarters. She continued to get worse, and at 7:30 p. m. could hardly get up, and when upon her feet could walk only a very few steps before she would fall down. By 9:30 p. m. she was unable to stand. Next morning at 8 o'clock she was about the same as when seen at 9:30 the night before. She made several attempts to get up, but each time would fall over. Over the entire body there was a peculiar trembling of the muscles. At 11 a. m. when-

ever disturbed or moved she went into convulsions. At 2:30 p. m. she had a severe convulsion, and died at 2:45 p. m.

Case No. 4—A ewe weighing 65 pounds was fed $1\frac{1}{2}$ pounds of green material at 2:45 p. m. At 8:40 p. m. she was sick. When she attempted to walk it was with a staggering motion. By 8 o'clock next morning she was down on her side, her head drawn far back, eyes staring and bleared, the pupils dilated. At times she would grind her teeth and champ her jaws. Most of the time there was a rapid running movement of the legs, followed by spells when they would be extended and extremely rigid. This series of movements continued until noon. By 2:30 p. m. the spasms had become weaker and of shorter duration, and the intervals between them were longer. At 3:30 p. m. the spasms were very weak, lasting for an instant or two and recurring about every ten minutes. The animal's temperature was then 105.6° . At 4 p. m. the spasms increased in violence, became more severe and were accompanied by bleating grunts. At 4:15 p. m. there was a severe spasm lasting about five minutes, accompanied by champing of the jaws, grinding of the teeth, and foaming at the mouth. The head was frequently drawn far back. These severe spasms continued about every two minutes until shortly before death, which occurred at 4:45 p. m.

The autopsy showed the spleen slightly mushy, the liver soft and friable; all other organs appeared normal. (Brain not examined.)

Case No. 5—A ewe weighing 80 pounds was fed at 2 p. m. January 2, 1919, $1\frac{1}{2}$ pounds of material that had dried naturally in the field. By 9 a. m. she was sick, walked with an unsteady gait, this being especially noticeable in the hind legs. At 8 a. m. the next day she was down and unable to get up, lying flat on her side with legs stretched out. Frequently she would chew at the bedding, and would champ her jaws most of the time. A peculiar trembling of the nose and lips was noticeable. At 9:30 p. m. she was in the same condition, groaning as if in pain, kicking the hind legs and frothing at the mouth. Her temperature at 1:30 p. m. was 103° . She was in this condition until 3 p. m., when she died.

Case No. 6—A sheep weighing 100 pounds was fed 2 ounces at 9 a. m. July 21. The next day at 10 a. m. 2 ounces more were fed. By noon the animal was sick, walking with an unsteady gait. It continued to get worse during the afternoon. Next morning it was unable to get up and had convulsions when disturbed. It soon fell over on its side and had running movements with its legs. It remained in this condition until death, which took place about 10 a. m.

The autopsy at 11 a. m. showed the following conditions: There was an acute cloudy swelling of the right kidney. The left was affected by a chronic disease not caused by poisoning. The liver was friable and highly reddened; blood flowed from cut surface. Some of the lymph glands were hemorrhagic. The brain showed marked congestion of the meninges, especially over the cerebellum and the anterior portions of the cerebrum. Many minute pin-point hemorrhages were found in the gray matter of the brain. These were located in the corpus striatum, corpus callosum, medulla, and medullary portions of the cerebrum.

Case No. 7—A sheep was fed 7 ounces of dry material at 2:30 p. m.,

August 25, 1920. It was found dead next morning at 8 o'clock. The autopsy showed the following: carcass bloated, pupils dilated. There was considerable congestion of the mucous membrane of the fourth stomach (abomasum) and small pin-point hemorrhages in the duodenum. The mucous membrane of the bladder was congested. There was a cloudy swelling of the kidneys. In the brain there was marked congestion of the pia mater, and marked injection of the capillaries of the medulla. Hemorrhages were found in the gray matter of the brain.

Case No. 8—A yearling calf weighing 211 pounds was fed 4½ pounds of fresh material on July 23, 1919, between 8:30 and 11:30 a. m. At 1 p. m. it was frothing at the mouth, and its breathing was rapid and irregular. These symptoms (perhaps not due to the milkweed) soon disappeared and the animal seemed normal the rest of the day. The next morning it walked with a peculiar, stiff staggering gait. It ate a little when fed. At 6 p. m. it was very weak and wobbly, much more so than in the morning. At 8 a. m. the next day it was much better, but still walked with a stiff unsteady gait.



Figure 10—An Early Stage of Poisoning by Narrow-Leaved Milkweed.

Case No. 9—A yearling calf weighing 225 pounds was fed 3½ pounds of green material at 10 a. m. on August 9, 1919. At 8 a. m. the next day it was sick and hardly able to get up. When on its feet it was very weak and staggered about. At noon it appeared to be in about the same condition as in the morning. By evening it was much better. Next morning at 8 a. m. it appeared to have quite completely recovered, but at times later in the day it staggered somewhat in walking.

Case No. 10—A yearling calf (195 pounds) was fed 5 pounds of green material at 4 p. m. on August 12, 1919. At 10 p. m. it was slightly sick. Next morning at 8 o'clock it was very sick and hardly able to walk, staggering and falling down frequently. Finally it collapsed and lay on its side, kicking rapidly with its legs. Death occurred at 10 a. m.

In the autopsy slight congestion was found in the fourth stomach and in the meninges of the brain.

Case No. 11—A yearling calf weighing 255 pounds was fed on October 16, 1919, between 4 and 6 p. m., three-fourths of a pound of dry material, which was collected September 6 and air-dried. At 8 a. m. next day it was sick and hardly able to walk. There was marked incoordination of the muscles of the hind legs. At 2 p. m. it was down on its side, with legs stretched out, head drawn far back, eyes rolled up; the animal appeared to be dying. This was followed by periods when it seemed to be getting better, but soon it would have another similar attack. During the afternoon it had a series of such attacks. At 8 p. m. it was still down and unable to get up. At midnight it was found

dead. The autopsy at 9 a. m. October 18 showed slight hemorrhages in the trachea, lungs hemorrhagic, kidneys congested; the heart had severe hemorrhages, both internally and externally.

Case No. 12—A yearling calf weighing 220 pounds was fed three-fourths of a pound of dry leaves at 5 p. m. July 21, 1920, which was all eaten next morning. At 8 a. m. the animal was sick and walked with an unsteady gait. The incoordination was most marked in the hind legs, especially the left hind leg. The back was curved to the right. It kept getting worse during the afternoon, and was found dead next day at 7 a. m. The autopsy at 9 a. m. showed the lymph glands hemorrhagic. There was acute inflammation of the liver and of the bladder. Small hemorrhages were found on the heart. The meninges of the brain were congested in region of the cerebrum. There were minute pin-point hemorrhages in the gray matter of the brain; these were more marked in the left side than in the right. These hemorrhages were located in the corpus striatum and in the medullary portion of the cerebrum and cerebellum.

The Time of the Year When Milkweed Is Poisonous.

All the feeding tests and field observations clearly indicate that this milkweed is poisonous at all times of the year. Animals have been poisoned and killed by plants collected in the spring of the year when they were just a few inches high, and by plants collected at later stages of growth up to the time when they had become fully matured and dried up in the fall of the year. Losses, therefore, may occur at any time when hungry animals feed upon this milkweed.

Prevention of Losses.

There is no known remedy for an animal badly poisoned with this plant. Consequently, to avoid losses it is necessary to understand the conditions under which an animal is most likely to eat a fatal dose. The fresh green milkweed as it grows in the field is not relished by any class of live stock and is eaten only under stress of hunger. This is not the case when it is cut and dried and put up in hay, for it then loses a large part of its disagreeable taste and is quite readily eaten. Thus hay containing this milkweed is always dangerous. On the other hand, ranges or pastures where this plant grows are not always dangerous, providing there is enough grass or other forage to satisfy the animals. Thus the losses occur (1) when hungry animals are being herded along driveways or trails where there is little or no feed for stock; (2) when stock are pastured on overgrazed or very closely grazed ranges supporting this plant; (3) when stock are held in pastures growing this milkweed until all the valuable forage has been eaten; and (4) when stock are bedded on areas where this milkweed is abundant.

Most plants of a poisonous nature contain substances which are distinctly distasteful to live stock. In general it may be said that an animal will first graze plants to which it has been used and whose flavor has been found agreeable. However, in the absence of good grazing it will eat what it is forced to eat in an effort to satisfy its hunger. It has been found that on certain ranges many plants are eaten which on other ranges are but seldom touched by the same class of live stock. Further, it has been observed that an animal in good flesh will not, when hungry, eat offensive plants as readily as poor

hungry animals will. Further, poor half-starved animals are more easily and readily poisoned than when well fed. Thus the condition of the animal determines in a large measure the extent to which it will graze poisonous plants and the probability of serious or fatal poisoning.

THE SHOWY-LEAVED MILKWEED AND OTHERS AS POISONOUS PLANTS

After two years of observation in the field and in the feeding corrals we have good reason to believe that the narrow-leaved milkweed is of far greater importance as a poisonous plant than any other species of milkweed growing in Nevada. For that reason only a few experiments with the other milkweeds have been made at this Station. The following discussion of the other species found in Nevada will give a general idea of their appearance and poisonous properties:

The Showy Milkweed (*Asclepias speciosa*).

This species of milkweed can be found in many parts of Nevada, but it does not seem to be very abundant anywhere. It requires about the same conditions for growth as does the narrow-leaved milkweed, and they are often found growing together.

Live stock do not like it, and it is eaten only under stress of hunger. Often fields grazed by cattle may be closely cropped, with this milkweed standing untouched.

As a poisonous plant it seems to be much less important than the narrow-leaved milkweed. Figure 4 shows the general appearance of this plant growing in the field.

Feeding experiments were made with (1) the green leaves, (2) the leaves as they had dried up naturally in the field, (3) the seeds, and (4) the pods.

TABLE X

The Showy-Leaved Milkweed—Green Leaves, Pods, Seeds, and Dried Leaves Fed to Sheep

Animal No.	Weight, lbs.	Date fed	Time fed	Amount fed, lbs.	Time symptoms observed	Time of death or recovery	Final result	Part of plant fed
42.	106	9-10	10:00 a. m.	1	-----	-----	Negative.	Green leaves
84.	103	9-11	9:00 a. m.	1½	-----	-----	Negative.	Green leaves
64.	99	9-12	10:00 a. m.	2	-----	-----	Negative.	Green leaves
100.	102	9-14	2:00 p. m.	2	-----	-----	Negative.	Green leaves
24.	85	9-6	2:30 p. m.	2½	9-7-3:00 a. m.	9-10-8:00 a. m.	Recovery.	Green leaves
33.	94	9-6	11:30 a. m.	2½	9-6-6:00 p. m.	7-7-8:00 a. m.	Death.	Pods
27.	81	9-12	4:00 p. m.	1	9-7-7:00 p. m.	Before 10:00 p. m.	Death.	Seeds
46.	80	12-16	11:30 a. m.	1	-----	-----	Negative.	Leaves dried
46.	80	12-28	10:00 a. m.	1	-----	-----	Negative.	in the field

The above feedings seem to show that (1) the green leaves are poisonous, (2) relatively large amounts are required to cause poisonous symptoms in a mature range ewe, (3) the pods alone are poisonous, (4) the seeds are highly poisonous, and (5) the plant dried naturally in the field contains little of its original poisonous matter.

Lambs have been fatally poisoned by grazing upon the tender growth

of this plant in the early spring months when all feed was scarce, but the recorded losses have not been large.

Symptoms of Poisoning by the Showy Milkweed.

The symptoms of poisoning were quite different from those produced by the narrow-leaved milkweed. The first symptom noted was extreme dullness, with a total loss of appetite and a tendency to lie down. In the severe cases the breathing was distinctly irregular, the breath being expelled with a grunt. Spasms were entirely absent and in the whole series symptoms seemed much unlike those produced by the narrow-leaved milkweed.

Typical Cases

Case No. 1—On September 6, 1918, at 2 p. m. a yearling range lamb weighing 85 pounds was fed $2\frac{1}{4}$ pounds of the fresh green leaves. At 8 a. m. the next day it showed symptoms of poisoning. During the day of September 9 it was still sick. September 10 it appeared to have recovered.

Case No. 2—September 6, 1918, at 11:30 a. m. a ewe weighing 94 pounds was fed $2\frac{1}{4}$ pounds of green pods. She was sick by 6 p. m. the same day. At 9:30 she was down; the breathing was labored and grunting. No other symptoms were exhibited. The next morning at 8 a. m. she was found dead.

Case No. 3—September 12, 1918, at 4 p. m. a yearling lamb weighing 81 pounds was fed one-half pound of seeds. At 7 p. m. of the same day it was extremely dull, respiration irregular. At 8:30 p. m. it was much worse; the breathing was more labored and each breath was made with a peculiar grunt. At 10 p. m. the animal was dead.

Heart-Leaved Milkweed (*Asclepias cordifolia*).

This plant is not abundantly distributed in the fields or ranges of Nevada. It occurs only in the mountain valleys, and does not appear to be poisonous.

Five feedings of this milkweed were made to sheep, the amounts fed ranging from one-half pound to $2\frac{1}{4}$ pounds. None of the feedings so far as could be observed had any poisonous effect upon the animal.

This milkweed can be distinguished from the showy milkweed by its surface being smooth or free from hairs, while the showy milkweed is covered with fine hairs. The base of the leaf is heart-shaped, which is not the case with the showy milkweed. There is little danger of confusing it with the narrow-leaved milkweed.

Prostrate Milkweed (*Asclepias cryptoceras*).

This species of milkweed is not important as a poisonous plant. It grows sparingly and is not widely distributed. It is a plant with somewhat tough leathery leaves, and its growth habit tends to be close to the ground. It may be disregarded as a poisonous plant of any importance in Nevada. One feeding of 3 pounds at one time was made to a mature sheep which did not seem to be at all injured by this large amount.

SECTION II

Technical Information Concerning the Narrow-Leaved Milkweed

This section is not intended for use by farmers and stockmen:

The facts included are for the information of chemists and veterinarians.

SYMPTOMS

The appearance of symptoms of poisoning in sheep by *Asclepias Mexicana* occurred about five to seven hours after artificial or natural feeding of the leaves or whole plant.

Five ounces of the dried plant appeared to be the minimum quantity producing symptoms of poisoning in sheep. Three pounds of the dried leaves appeared to be the minimum quantity producing toxic symptoms in a 250-pound calf, with subsequent recovery.

The first noticeable symptoms in either cattle or sheep are general depression, refusal to eat, and unsteady wobbly gait. The unsteady gait is due to partial paralysis of the hind limbs. Occasionally the paralysis is confined to only one limb. This causes an incoordination in movement, and the animal sways from side to side. Marked muscular trembling is sometimes observed, and in a few hours the animal lies down, refusing to arise. During the period of recumbency tetanic spasms (rigid extension) of the limbs occur at intervals of two or three minutes.

There is no perceptible elevation of temperature. The pulse rate increases with the duration of the attack and shortly before death may attain the rate of 180 per minute, becoming very thready. Breathing is labored and rapid. The head is extended backward and quite rigid. The attack may persist for twenty-four hours, and immediately before death the animal lies in a semicomatose state. In case affected animals recover, the gait is unsteady for two or three days. In some cases incoordinate movements of the hind limbs persist as long as one week after the other symptoms have disappeared.

POST-MORTEM LESIONS

These are not especially characteristic.

Summarizing the observations of post-mortem lesions in sheep and cattle, the following pathological changes were fairly constant in deaths due to ingestion of *Asclepias Mexicana*:

The liver exhibited passive congestion and low-grade cloudy swelling. Kidneys light in color with low-grade cloudy swelling. The mucosa of the abomasum may exhibit congestion of a moderate degree which may be continuous throughout the small intestine. Occasionally marked arborization of the blood-vessels of small intestines is observed.

Occasional subepicardial petechial hemorrhages are observed along the coronary vessels and auriculo-ventricular border. The heart muscle is pale and friable.

The pia mater in cerebral and cerebellar regions exhibited a marked congestion on cut surfaces; minute capillary hemorrhages were observed in the medullary portion of the cerebrum and cerebellum, also in the corpus striatum. The lateral ventricles contained a moderate amount of sero-sanguinous fluid.

Histopathological examination of selected tissues confirmed the observations made at the autopsy. In the brain the hemorrhages were largely from the minute capillary vessels. Occasional interstitial capillary hemorrhages were observed in the reticular tissue between the convolutions of the cerebrum.

The liver exhibited acute parenchymatous hepatitis with passive congestion. The kidneys exhibited low-grade parenchymatous nephritis. Myocardium, acute myositis.

THE ACTIVE PRINCIPLE OF *ASCLEPIAS MEXICANA*

Several species of *Asclepias* which are physiologically active have been examined chemically, and, from the work done by various experimenters on those investigated, the compounds to which the physiological activity of the plant may be ascribed apparently varies considerably. Glucosides have been found in several species, which act on the animal organism as an emetic. In another species (*syriaca*) a crystalline resinous substance was found which acted as an anodyne and cathartic. Quackenbush reports finding a crystalline glucoside in *Asclepias tuberosa* and *Asclepias cornuti*. March, Clawson, Couch, and Eggleston (U. S. D. A., Bul. 800) have recently reported preliminary experiments on *Asclepias galioides*, a species closely related to *A. Mexicana*, in which they found evidence of the presence of toxic compounds having narcotic properties and also those producing a spasmodic type of intoxication. The active principles were not isolated, but experiments on small animals indicated the presence of toxic material in successive extracts of the dry plant, and gave some idea of the solubility relations of these materials. They found that petroleum ether removed no active material, but that benzol extracted substances which were toxic and produced effects in test animals similar to those observed in poisoning of sheep by the plant. Ether and chloroform extracts from the material already treated with benzol and petroleum ether also were toxic, indicating the possible presence of more than one active principle. Other solvents failed to remove toxic matter from the residue. Evidence of the presence of a minute quantity of alkaloids was obtained; volatile poisons and saponins were not found. Alcohol alone was found to extract all of the toxic material, a part of which was soluble in water producing narcosis, and the part insoluble in water producing poisoning with symptoms typical of range poisoning.

A portion of the material used in our feeding experiments was examined, and results were obtained which were in some ways similar to those reported on *Asclepias galioides*.

A small quantity of the plant was extracted successively with solvents and the amounts extracted by each were as follows:

Benzol	10.55%
Ether	0.64%
Chloroform	0.70%
Ethyl acetate	2.68%
Alcohol	0.46%

Each of the residues from these extractions were administered to guinea pigs by mouth in amounts corresponding in each case to five grams of the dry plant, and all appeared to be nontoxic, except the benzol extract. Thus benzol is capable of removing all of the toxic substances. No reactions were noted in the cases of the materials extracted by the other solvents, the animals appearing normal.

Another small portion of the dry powder was studied by extracting with dilute acid and testing with the general alkaloidal reagents. With each reagent used, indication was obtained of the presence of alka-

loids. No alkaloidal preparations were made for animal experiments. A larger portion of the plant which had been dried was extracted with alcohol by percolation. The alcohol was then removed, and the remaining sirup was evaporated to dryness and extracted repeatedly with boiling water. The aqueous extract so obtained was clear and of a dark-brown color. It had a very sweet taste with a slightly bitter after-taste. The residue from this extraction was a black resinous mass.

The aqueous extract and black residue were administered to a guinea pig by mouth. The amounts given corresponded to 5 grams of the dried plant in each case. The aqueous extract proved to be nontoxic, the animal remaining normal, but the black residue was fatal in three hours. The symptoms exhibited by this animal were the same as those shown by the one to which was given the benzol extract. Apparently, then, the active material of *Asclepias Mexicana* differs from that found in *Asclepias galioides* by Marsh, Clawson, Couch, and Eggleston in that the substance producing narcosis found by them in *Asclepias galioides* is lacking in this plant. It is possible, however, that with doses representing larger quantities of the plant the narcotic effect might be present and more noticeable.

50



BEFORE THE PUBLIC SERVICE COMMISSION OF NEVADA

ELKO ASSOCIATION OF RETAIL MERCHANTS

v.

SOUTHERN PACIFIC COMPANY AND

WESTERN PACIFIC RAILROAD COMPANY

CASE No.

C-587

APPEARANCES:

For the Commission—

J. F. SHAUGHNESSY, Chairman;

W. H. SIMMONS, Commissioner;

J. G. SCRUGHAM, Commissioner.

For the Elko Association of Retail Merchants,—

GEORGE FOX.

For the Southern Pacific Company—

FRANK B. AUSTIN, Counsel;

S. N. BOSTWICK, Assistant General Freight Agent;

J. M. FULTON, Assistant General Freight and Passenger
Agent;

V. S. ANDRUS, Assistant Superintendent of Transportation.

For the Western Pacific Railroad Company—

A. P. MATHEW, Counsel;

ARCHIBALD GREY, General Freight Agent;

H. K. FAYE, Traffic Manager.

OPINION

SHAUGHNESSY, *Chairman:*

The complaint in the above-entitled proceeding protests against the removal of two connecting tracks between the lines of the two defendant carriers at Elko, Nevada, and requests that one of these tracks be retained for the future, and that switching and interchange service between industrials and warehouses located upon the tracks of the Southern Pacific Company and the Western Pacific Railroad Company be reestablished by order of this Commission, and that reasonable charges for this service be established.

During federal control track connections between the Southern Pacific and the Western Pacific lines were installed at Elko to facilitate unified operation of the carriers. It is alleged that these tracks belong to the Federal Railroad Administration and neither of the carriers have any control over them, and at the present time they are not being

used because the interchange service and switching, which was formerly rendered under Government control, has, since the return of the carriers to private operation on March 1, 1920, been discontinued.

The status of the proceeding may to some extent be the equivalent of ordering the construction of an interchange track between said defendant carriers' lines for the purpose of rendering transfer or switching service at just compensation therefor between the industries and warehouses located upon the respective lines in question, but, on the other hand, the track in question is established and during the past two years commercial and industrial enterprises have received the service and have adjusted their business accordingly.

The testimony of Mr. George Fox, on behalf of the complainants, was to the effect that the reestablishment of the service in question is a public necessity and convenience that should not be withdrawn from the shippers of Elko; that a number of warehouses are situated upon the tracks of the Southern Pacific Company and the Western Pacific Railroad Company within the yard limits of the City of Elko; that unless there is a continuation of such service it would involve trucking shipments to and from warehouses and cars on these respective lines at substantial cost, delay, and inconvenience to shippers, instead of having the cars switched directly to or near warehouses for more speedy unloading and release of car equipment—a highly essential consideration in the face of the present car shortage.

Upon testimony put in evidence by Mr. Andrus of the Southern Pacific Company it appears that the cost of maintaining one of these tracks would not exceed \$50 per annum; that the cost of transfer and switching service by the Southern Pacific local train crew (assigning an average of forty-five minutes time necessary for the switching of each car, comprising the load in and empty out, or vice versa) would be approximately \$6 per car. Without approving or rejecting this estimate, and assuming a rate of \$10 per car for this service, it will be noted that there would be a net revenue of \$4 per car. In suggesting a rate of \$10 per car for this service, it is to be noted that it is based upon a comparatively small amount of intrastate business available, and therefore is not to be taken as a basis in other cases, where the volume of business is larger. At larger terminal, commercial, and industrial points the transfer and switching rates vary from \$2.50 to \$7.50 per car. It may also be noted, in passing, that the defendant carriers may economically enter into an operating arrangement by which the switch engine regularly maintained by the Western Pacific at its Elko terminal could perform all of this service in connection with its regular yard operations at that point. By such an arrangement, and by extending the service to interstate business, a very important saving in present car detention at Elko could be effected, but upon this point we make no finding, and we shall base our conclusion upon whether or not the continuation of the service is a public necessity and convenience for the transportation of interstate business.

With respect to the reestablishment of the service in question, the Western Pacific Railroad is neutral and agrees to abide by the decision of the Commission in the premises. On the other hand, the Southern Pacific opposes the reestablishment of the service; raises the question

of this Commission's jurisdiction to make an order dealing with the switching or transferring of traffic that may be classed as interstate, and alleges that an order requiring the retention of one of these track connections is not within the purview of the Nevada Public Service Commission Act, in that the statute contemplates track connections voluntarily made by the railroad companies and not those constructed by the Railroad Administration over which neither the carriers nor the Commission have any control or jurisdiction. Said defendant further alleges that by the Act of 1907 the Commission was authorized to require the construction of connecting transfer tracks between two or more railroad lines passing through any town or city, and such railways were required to interchange cars (Sec. 7, Act of March 5, 1907, Rev. Laws, 4559); and that by section 45 of the Act of 1919 (Stats. 1919, chap. 109, p. 198; Rev. Laws of 1919, p. 3154) the Act of 1907, as well as that approved March 23, 1911, was repealed, and that, inasmuch as the Commission's powers are limited to those conferred by statute, the Southern Pacific Company, defendant, respectively submitted that the Commission has no power to grant the relief requested by the complainant.

PUBLIC SERVICE COMMISSION OF NEVADA HAS AUTHORITY TO REQUIRE THE CONSTRUCTION AND MAINTENANCE OF CONNECTING TRACKS BETWEEN THE LINES OF TWO CARRIERS AND THE INTERCHANGE OF TRAFFIC THEREOVER.

It is true that in consolidating the Railroad Commission Act of 1907, as amended, with the Public Service Commission Act of 1911, as amended, and which Acts were officered and administered by the same personnel, certain changes, presumably in the interest of brevity, were made by the Legislature of 1919 without impairing the Commission's broad delegation of authority to act in a proceeding such as the one here under consideration.

The Act of March 5, 1907 (Stats. 1907, p. 73), provided specifically in section 7 that the Commission would have power to order the construction of connecting or transfer tracks between two or more lines of railroad. This Act was repealed by the Public Service Commission Act of March 28, 1919 (Stats. 1919, p. 198), and the new statute apparently does not contain a specific grant of power of this immediate character. The Commission is, however, invested with very broad authority over the installation of facilities and the regulation of service, and there seems to be no reasonable doubt that its jurisdiction extends to cases of this character. We quote the pertinent portions of the text of sections 27 and 18 of the Public Service Commission Act, approved March 28, 1919:

SEC. 27. If, upon any hearing and after due investigation,
* * * it be found that the service is inadequate, or that any reasonable service cannot be obtained, the commission shall have the power to substitute therefor such other regulations,
* * * practices, service, or acts, and make such order relating thereto as may be just and reasonable.

SEC. 18. The commission shall have power, in the interest of * * * service, after hearing to determine and order

required and necessary * * * tracks * * * and all property used or useful in the service; * * * and to make and enforce any rule or regulation necessarily incident thereto; * * *

There is, in addition to these sections, a specific grant of authority which is apparently applicable to the circumstances developed at the hearing in the instant case. Section 19 of the Nevada Public Service Commission Act reads as follows:

SEC. 19. It shall be the duty of all railroad corporations, whose tracks connect, reciprocally to transfer cars from one railroad to the other upon demand of shippers or of the railroad concerned, at just and reasonable charges to be fixed by the commission.

The terms of this section are clear and seem to clothe the Commission with all necessary authority as far as regulation of intercarrier service and rates applicable thereto are concerned. Further, it seems clear from the text of section 18 above quoted that the Commission has power in the interest of service to require the construction of necessary tracks. It has power further under section 27 to require an improvement in service which is found to be inadequate. This authority comprehends the right to regulate relations between connecting carriers. The point has been clearly determined by the United States Supreme Court in *Atlantic Coast Line Railroad Company v. North Carolina Corporation Commission*, 206 U. S. 1. In that case the North Carolina Corporation Commission made an order requiring the restoration of a connection between a passenger train of the Atlantic Coast Line Company and a passenger train of the Southern Railway Company at Selma, N. C. The order was resisted upon the ground, among others, that, although the Commission had authority to regulate the service of a particular carrier, it had no authority to regulate the service of two connecting carriers. The Supreme Court disposes of this contention in the following terms:

This reduces itself to the contention that, although the governmental power to regulate exists in the interest of the public, yet it does not extend to securing to the public reasonable facilities for making connection between different carriers. But the proposition destroys itself, since at one and the same time it admits the plenary power to regulate, and yet virtually denies the efficiency of that authority. That power, as we have seen, takes its origin from the quasi-public nature of the business in which the carrier is engaged, and embraces that business in its entirety; which, of course, includes the duty to require carriers to make reasonable connections with other roads, so as to promote the convenience of the traveling public. In considering the facts found below as to the connection in question—that is, the population contained in the large territory whose convenience was subserved by the connection, and the admission of the railroad as to the importance of the connection—we conclude that the order in question, considered from the point of view of the requirements

of the public interest, was one coming clearly within the scope of the power to enforce just and reasonable regulations.

Under the principle of this decision it would seem to be clear that, if the Commission has authority to require a particular carrier to install track facilities or to improve its service, it has the same authority to require the construction or maintenance of tracks by two carriers and the performance of a joint or intercarrier service.

STATE MAY REQUIRE INTERCHANGE TRACKS AND SWITCHING SERVICE

That a State may competently require the construction and maintenance of a physical connection between the tracks of two competing railroad companies, and the interchange of intrastate traffic thereby, is now so well established by decisions of the Supreme Court of the United States as to preclude any controversy as to its validity. Perhaps the leading case upon the point is *Wisconsin, Minnesota and Pacific Railroad Company v. Jacobson*, 179 U. S. 287.

In the *Jacobson* case, *supra*, it appeared that the Railroad Commission of Minnesota made an order requiring two railroad companies to construct a track connecting their respective lines at Hanley Falls, Minn. An appeal was taken by the two companies to the District Court of the State, but the Court sustained the order. The judgment of the District Court was sustained by the Supreme Court of Minnesota, and, upon writ of error to the United States Supreme Court, the judgment was affirmed. The Court held squarely that the requirement of track connections and facilities for the interchange of traffic is within the power of the State and not antagonistic to any provision of the Constitution. It is significant that the Court went so far as to hold that the power is validly exercised, even though it requires the carriers to invoke the power of eminent domain and thereby to incur a reasonable expenditure for right-of-way land. This case has been repeatedly cited and followed in more recent decisions of the United States Supreme Court.

In the case of *Grand Trunk Railway Company v. Michigan Railroad Commission*, 231 U. S. 457, the Supreme Court upheld an order of the Michigan Railroad Commission suspending the tariff of an interstate railway company which contemplated a substantial increase in charges for industrial as well as intercarrier switching within the switching limits of Detroit, Mich. It was urged on the part of the carriers that they were not incorporated for the purpose of performing local or intrastate switching business, but for the purpose of interstate and intrastate commerce, and the validity of the Commission's order was attacked upon this ground. We quote from the opinion of the Court:

The question in the case is whether, under the statutes of the State of Michigan, appellants can be compelled to use the tracks it owns and operates in the City of Detroit for the interchange of intrastate traffic; or, stating the question more specifically, whether the companies shall receive cars from another carrier at a junction point or physical connection with such carrier within the corporate limits of Detroit for

transportation to the team tracks of the companies; and whether the companies shall allow the use of their team tracks for cars to be hauled from their team tracks to a junction point or physical connection with another carrier within such limits, and be required to haul such cars in either of the above-named movements or between industrial sidings. * * *

The proposition of appellants is, as said by the district court, that such service and team-track service "are not in a proper sense transportation, but are essentially distinguishable therefrom"; or, to put it another way—and one which expresses more specially the contention of appellants—they are mere conveniences at the destination or initial point of the transportation, and hence are terminal facilities merely, and their use is not required to be given to other railroads. The district court did not regard them in the latter character. After stating the conditions which exist in Detroit and its extent, the court said of them: "Such tracks are necessary to prevent the congestion which would result from requiring all carload freight, both in and out, to be delivered at the freight depots of the respective roads, and in a very proper sense are shipping stations." The court concluded that the services were transportation, and that the statute of the state validly empowered the commission "to require local transportation by a railroad between its own shipping stations within a city, whether such plurality of shipping stations has been voluntarily established by the railroad, as here, or has been required by the commission, under its lawful powers; and provided such transportation is for such substantial distance and of such a character as reasonably to require a railroad haul, as distinguished from other means of carriage." The court further said: "It is also clear that a statute validly may, and the statutes we are considering do, authorize the employment of such depots, side tracks, and team tracks of a railroad for transporting carload freight to or from the junction of such road with another road as a substantial part of a continuous transportation routing, where such junction is outside the city limits." (198 Fed. 1016, 1017.) And it was remarked that the fact that the freight movement begins and ends within the limits of a city does not take from it its character "of an actual transportation between two termini," the other conditions obtaining. We concur in the conclusion of the court.

The Court adds that the decision is justified by the doctrine of *Wisconsin, Minnesota and Pacific Railroad Company v. Jacobson*, *supra*.

In *Michigan Central Railroad Company v. Michigan Railroad Commission*, 236 U. S. 615, the Court again sustained an order of the Michigan Railroad Commission requiring a steam-railroad company and an interurban electric-railway company to interchange traffic at a point of physical connection between the tracks of the two com-

panies at Oxford, Mich. It will be profitable to quote somewhat fully from the opinion of the Court in this case:

That a state, in virtue of its authority to regulate railroads as public highways, may, in a proper case, require two companies to make a connection between their tracks so as to facilitate the interchange of traffic, without thereby violating rights secured by the Constitution of the United States, is settled by the decisions of this court in *Wisconsin, M. & P. R. Co. v. Jacobson*, 179 U. S. 287, 296, 301, 45 L. Ed. 194, 199, 201, 21 Sup. Ct. 115; and *Washington ex rel. Oregon R. & Nav. Co. v. Fairchild*, 224 U. S. 510, 528, 56 L. Ed. 863, 869, 32 Sup. Ct. 535.

That a state, acting within its jurisdiction, and not in hostility to any federal regulation of interstate commerce, may compel the carrier to accept loaded cars from another line and transport them over its own, such requirement being reasonable in itself, is settled by *Chicago, M. & St. P. R. Co. v. Iowa*, 233 U. S. 334, 344, 58 L. Ed. 988, 993, 34 Sup. Ct. 592. In that case it was held there was no essential difference, so far as concerned the power of the state, between such an order and one requiring the carrier to make track connections and receive cars from connecting roads in order that reasonably adequate facilities for traffic might be provided.

It seems to us that the principle of these decisions sustains also the state's power to make a reasonable order requiring a carrier to permit empty or loaded cars owned by it to be hauled from its line upon the connecting line for purposes of loading or delivery of intrastate freight, and to permit the cars of other carriers loaded with such freight consigned to points on the connecting line to be hauled from its line upon the connecting line for purposes of delivery. This question was left undetermined in *McNeill v. Southern R. Co.*, 202 U. S. 543, 563, 50 L. Ed. 1142, 1149, 26 Sup. Ct. 722, which had to do with a state regulation operating directly upon *interstate* commerce.

A still more recent decision to the same effect will be found in the case of *Seaboard Air Line Railway v. Railroad Commission of Georgia*, 240 U. S. 324. In this decision again the Supreme Court sustained an order of a State Railroad Commission requiring two railroads to make and maintain track connections for the interchange of traffic at a point within the State. The Court says:

It is within the power of a state, acting through an administrative body, to require railroad companies to make track connections where the established facts show public necessity therefor, just regard being given to charges which will probably result on one side and necessary expense to be incurred on the other.

A STATE IS WITHOUT AUTHORITY TO REQUIRE THE INTERCHANGE OF INTERSTATE TRAFFIC BETWEEN CONNECTING CARRIERS, EITHER IN THROUGH OR SWITCHING SERVICE.

It is, of course, well established that a State may not directly regulate or burden *interstate* commerce. The precise line of demarcation between the authority of the State and the authority of the Federal Government over commerce has not yet been determined, but the authorities seem to be opposed to the assertion of any power on the part of the State to regulate the delivery or interchange of interstate traffic. In the case of *McNeill v. Southern Railway Company*, 202 U. S. 543, the United States Supreme Court held that the North Carolina Corporation Commission exceeded its authority in making an order requiring an interstate carrier to deliver cars loaded with interstate freight upon a private siding or spur track. The Court held that, until the shipments had been delivered to the consignee, interstate transportation had not been completed, and that accordingly the order of the Corporation Commission represented an invasion of the federal jurisdiction.

A decision more immediately in point is *Illinois Central Railroad Company v. DeFuentes*, 236 U. S. 157. It appeared in this case that the Railroad Commission of Louisiana had made an order providing that no railroad company should refuse to switch cars "for any other railroad with which it connects, or any shipper or consignee, at rates approved or established by the commission, whether such cars are to be loaded with freight to be shipped out of the state, or are loaded with freight shipped into the state." The validity of this order was attacked by the Illinois Central Railroad Company upon the ground that it represented an unlawful attempt to regulate interstate commerce. The Supreme Court held that the order of the State Commission was beyond its powers. The Court says:

When freight actually starts in the course of transportation from one state to another it becomes a part of interstate commerce. The essential nature of the movement, and not the form of the bill of lading, determines the character of the commerce involved. And generally when this interstate character has been acquired it continues, at least, until the load reaches the point where the parties originally intended that the movement should finally end. *McNeill v. Southern R. Co.*, 202 U. S. 543, 559, 50 L. Ed. 1142, 1147, 26 Sup. Ct. 722.

The doctrine of these cases and of other cases of similar purport which might be cited seems clearly opposed to the existence of any right on the part of the State to make an order requiring carriers to transfer between their respective lines cars loaded with *interstate* freight, or to fix the charges for such service. But as to intrastate traffic, the State is equally as supreme in its jurisdiction to control and regulate its commerce as the Federal Government is to regulate interstate and foreign commerce.

We accordingly conclude that, while the Commission is without authority to require the transfer of interstate traffic between con-

necting carriers or to fix charges therefor, it has authority (1) to require the construction of connecting tracks between the lines of two railroad companies, or to require the continued maintenance of existing connecting tracks; and (2) to require the transfer of cars in intrastate service between the rails of connecting carriers and to fix charges therefor.

ADEQUATE PROVISION FOR A TERMINAL INTERCHANGE PRODUCES GREATER VOLUME OF BUSINESS FOR THE CARRIERS AND INCREASED SERVICE TO THE SHIPPERS WITH MINIMUM OF EQUIPMENT.

This is a service case rather than a rate consideration and extends beyond the question of the necessity and convenience of the immediate industrial track beneficiaries. Coordination of terminal facilities as far as possible, expedites the movement of commerce by quick delivery and prompt release of cars—from which it follows that more shippers can be served on the one hand and on the other a larger volume of business can be handled with the same equipment, resulting in greater revenue and economy to the carriers than would otherwise be the case. Because of the expedited service to the public and the economy and increased revenue to the carriers, the joint use of switching track facilities should be arranged for at all railway terminal and junction points.

The question here presented does not “involve the enforcement by the State of a general scheme of maximum rates, but only whether an exercise of state authority to compel a carrier to perform a particular and specified duty is so inherently unjust and unreasonable as to amount to the deprivation of property without due process of law.” (North Carolina Train Service Case, 206 U. S. 1; and Kansas Train Service Case, 216 U. S. 262.) Because of the reasonableness and the justice of the considerations herein presented, we do not believe that we have transgressed this fundamental rule, and we are therefore of the opinion that the public necessity and convenience justifies the continued maintenance and operation of one of the interchange tracks at Elko. We hereby designate the east interchange track as the most serviceable and convenient.

We are also of the opinion that a rate of \$10 per car should be fixed as just compensation in this case. Further, the Southern Pacific Company should be required to switch and perform intrastate service from its yard and industrial tracks and make delivery of loaded or empty cars to the interchange, yard, or industrial tracks of the Western Pacific Railroad Company. Likewise, the Western Pacific Railroad Company should be required to switch and interchange from its yard and industrial tracks to those of the Southern Pacific Company.

Further, in establishing the aforesaid \$10 rate, the carriers may file with the Commission for consideration and approval such rules, regulations, and operating agreements as may be necessary to effectuate the service in question and to increase their operating revenues and economies by augmenting the car supply and enlarging railway service to the people of Nevada.

An appropriate order will be entered.

ORDER

At a general session of the Public Service Commission of Nevada, held at its offices in Carson City, Nevada, on the 27th day of November, 1920:

Present—Chairman J. F. Shaughnessy, Commissioners W. H. Simons and J. G. Scrugham, and Secretary Benson Wright.

Pursuant to the conclusions reached in the foregoing opinion, which are hereby referred to and made a part hereof, it is hereby

ORDERED, That the Southern Pacific Company and the Western Pacific Railroad Company shall, on or before December 31, 1920, jointly establish, maintain, and operate at Elko, Nevada, for intrastate business, an interchange track; and it is further

ORDERED, That, on or before December 31, 1920, the Southern Pacific Company shall, upon order from shippers, switch and perform intrastate service by delivering loaded or empty cars for delivery or loading at warehouses from its yard and industrial tracks to the interchange, yard, or industrial tracks of the Western Pacific Railroad Company at Elko, Nevada; and it is further

ORDERED, That on or before December 31, 1920, the Western Pacific Railroad Company shall, upon order from shippers, switch and perform intrastate service by delivering loaded or empty cars for delivery or loading at warehouses from its yard and industrial tracks to the interchange, yard, or industrial tracks of the Southern Pacific Company at Elko, Nevada; and it is further

ORDERED, That the shippers shall pay as compensation for this interchange switching service at the rate of \$10 per car, comprising loaded car in to industrial track and empty car out, or vice versa.

BY THE COMMISSION,

[SEAL]

BENSON WRIGHT, *Secretary.*

Dated November 27, 1920.



CARSON CITY, NEVADA

STATE PRINTING OFFICE : : JOE FARNSWORTH, SUPERINTENDENT
1920

STATE OF NEVADA

BIENNIAL REPORT

OF THE

STATE ENGINEER

1919=1920

J. G. SCRUGHAM
State Engineer of Nevada



CARSON CITY, NEVADA

STATE PRINTING OFFICE : : : : : JOE FARNSWORTH, SUPERINTENDENT

1921



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LETTER OF TRANSMITTAL

CARSON CITY, NEVADA, January 1, 1921.

HON. EMMET D. BOYLE, *Governor of Nevada.*

DEAR SIR: Pursuant to section 14, chapter 140, Statutes of 1913, I have the honor to transmit herewith a report of the work of this office for the biennial period ending December 31, 1920.

Respectfully submitted,

J. G. SCRUGHAM,
State Engineer.

PERSONNEL OF THE DEPARTMENT OF STATE ENGINEER

J. G. SCRUGHAM.....	State Engineer
ROBERT A. ALLEN.....	Assistant State Engineer
B. G. MCBRIDE.....	Field Engineer
H. M. PAYNE.....	Office Engineer
E. A. BROWN.....	Assistant Office Engineer
PARVIN P. JONES.....	Chief Clerk
IRA MACFARLAND.....	Special Assistant to State Engineer Engineering Experimentation
L. H. TAYLOR {	Special Assistants to State Engineer Humboldt River Adjudication
M. E. JEPSEN }	

BIENNIAL REPORT

BIENNIAL REPORT

INTRODUCTION

The serious loss of population in Nevada during the last decade was caused by a combination of conditions which should be thoughtfully considered by every citizen of the State.

An analysis of the census returns shows that the greatest increases in wealth and production came in those communities which made the best economic utilization of their water supplies.

When the complex problems of adjudication, regulation, distribution, and storage of water are solved in an intelligent and clear-sighted manner, all parts of the State can profitably support a larger population than at the present time.

This report endeavors to present these problems in concise language, together with specific recommendations for legislative and other needed action. Under appropriate titles, a statement is given of what has been accomplished by the Engineer's office and also a review of the possibilities for development in various parts of the State. In addition the expenditures and receipts of the office are set forth in detail as required by law.

RECOMMENDATIONS

(a) Increase of Fees.

Many of the following recommendations involve the expenditure of money. The State Engineer believes that, if these expenditures are authorized, they should be met, at least in part, by an increase in the fees charged for issuing water-right permits, making surveys, etc.

The fees now required are in many cases grossly inadequate for the service rendered. The following revised schedule of fees is therefore recommended:

For making survey and preparing maps of lands: For first 100 acres, increase the fee from 15 cents per acre to 75 cents per acre. From 100 acres to 500 acres, increase the fee from 10 cents per acre to 50 cents per acre. From 500 acres to 1,000 acres, increase the fee from 10 cents per acre to 35 cents per acre. For over 1,000 acres, increase the fee from 5 cents per acre to 25 cents per acre.

For making surveys and preparing maps for power appropriations: For first 100 horsepower, increase fee from 25 cents per horsepower to 75 cents per horsepower. From 100 horsepower to 500 horsepower, increase fee from 15 cents per horsepower to 50 cents per horsepower. From 500 horsepower to 1,000 horsepower, increase fee from 15 cents per horsepower to 35 cents per horsepower. Over 1,000 horsepower, increase fee from 5 cents per horsepower to 25 cents per horsepower.

For examining and filing an application for permit to appropriate water: Increase fee from \$15 to \$20.

For issuing and recording permit to appropriate water for irrigation purposes: For each acre to be irrigated up to and including 100 acres, increase fee from 5 cents to 10 cents. For each acre in excess of 100 acres and up to and including 1,000 acres, increase fee from 3 cents to 5 cents. For each acre in excess of 1,000 acres, increase fee from 2 cents to 3 cents.

For issuing and recording permit for power purposes: For each theoretical horsepower to be developed up to and including 100 horsepower, increase fee from 25 cents to 30 cents. For each horsepower in excess of 100 horsepower up to and including 1,000 horsepower, increase fee from 15 cents to 20 cents. For each horsepower in excess of 1,000 horsepower, increase fee from 10 cents to 15 cents.

For issuing and recording permit to store water: For each acre-foot of water to be stored up to and including 1,000 acre-feet, increase the fee from 2 cents to 5 cents. For each acre-foot in excess of 1,000 acre-feet, increase fee from 1 cent to 3 cents.

For blue-print copy of any drawing or map: Increase fee per square foot from 10 cents to 15 cents.

For issuing and recording permit to appropriate water for any other purpose: For each second-foot of water or fraction thereof, increase fee from \$5 to \$10.

Minimum fee for issuing and recording permit to appropriate water for any purpose, increase fee from \$5 to \$10.

Much trouble has been caused by the granting of permits on unadjudicated sources of water supply. While such permits are always made subject to prior rights, the practical working of the situation is that the permit rights usually infringe on the prior vested rights, the exact extent of which have not been determined.

The Engineer has therefore adopted a policy of refusing to grant permits on unadjudicated sources unless the presence of surplus water is clearly proven by authentic measurements.

Where permits are granted to utilize such excess, the above recommended schedule of fees constitutes a very reasonable charge.

(b) Adjudications.

The greatest handicap to the agricultural development of the State is the fact that no satisfactory regulation, distribution, or storage of water can be made on any stream until the relative rights of the parties at interest have been determined.

The Engineer's office now has on file more than 5,000 claims of vested right, permits, or applications which must be examined and checked in detail before he can properly issue final findings or certificates thereon. The property rights involved exceed \$60,000,000 in value. The problem is further complicated by the requirement of the law necessitating formal hearings on contested claims, amounting to nearly 800 in number. With the existing organization and appropriations available, it is physically impossible to dispose of more than a few hundred cases per year. After a careful study of the situation, it became obvious that a period of probably twenty years would elapse before any substantial settlement of water rights could be effected.

The State Engineer thereupon decided that a drastic change in the method of procedure was necessary. With the consent of the interested parties, hearings on more than 700 contests of claims for water rights were arbitrarily given indefinite postponement. Water-users' associations were formed in nearly every district in the State, and with their assistance the State Engineer immediately commenced preparation of tentative or ex parte findings on all claims filed with his office. If expeditious action is desired, the water law must be amended so as

to permit the contests to be filed against and heard primarily on these tentative findings of the Engineer, instead of the claims of the appropriators, thereby eliminating the hearing of hundreds of formal contests. No rights of any claimant are placed in jeopardy by this proposed change of procedure, and much time and expense will be saved.

Experience indicates that acreages and priorities to which water rights are assigned can be satisfactorily established without great difficulty, but that serious contests are likely to occur on account of divergence of views as to the quantity of water required to properly irrigate lands. After the Engineer's findings are submitted, the courts may require many years to hear and decide these contests, especially on a complicated stream system like the Humboldt River.

In order to obviate such probable delays, the State Engineer recommends that suitable legislation be passed to enable courts of the State to enter interlocutory decrees covering the amount of water allotted to lands. A period of five years after the entering of a decree should be given the State Engineer or other parties at interest to ask for modifications of duty of water allowances, such requests to be based on actual water measurements and crop investigations. This proposed amendment to the water law will make possible the issuance of decrees soon after the submission of the Engineer's findings to the court and will at the same time protect the vested rights of the lawful appropriators as well as the rights of the State to prevent wastage of water.

It is further recommended that specific legislation be enacted to permit the State Engineer to employ an attorney highly qualified on water law to advise the Engineer upon the numerous technical legal questions encountered in making findings on water rights, and to appear for him in the court proceedings which follow. Within the next two years the Engineer's office expects to submit adjudication findings involving property rights valued at more than \$40,000,000. The importance of having a sound legal basis for these findings cannot be overestimated.

The office force employed by the Engineer's office under existing appropriations is utterly inadequate to make any appreciable headway in the examination and checking of the two-thousand-odd claims which have been filed by appropriators under pending adjudication proceedings.

In order not to delay matters the State Engineer secured voluntary contributions amounting to \$17,500 from various water-users' associations, and employed an extra force of engineers and examiners to check the claims.

In the future this expense should properly be borne by the State, and a special appropriation of \$25,000 is requested to permit the continued employment of additional engineer examiners and reporters of testimony. If adequate funds are not made available, no expeditious action can be secured in adjudication matters.

(c) Regulation and Distribution.

The problems of regulation and distribution of water are comparatively simple after the relative rights have been determined, provided that the services of capable water masters can be secured.

The provisions of the present law relative to the employment and

compensation of water masters are grossly unsatisfactory. In order to secure satisfactory service the law must be amended to permit the payment of adequate salaries to competent persons. At present the maximum allowance is \$5 per day to cover transportation, subsistence, and services. This allowance should be fixed by the State Engineer, subject to the consent and approval of the majority of the water users served.

At present there is no uniformly satisfactory method provided for collection of assessments to pay the expenses incident to the distribution of water. An unnecessary burden has frequently been thrown upon the office by reason of individuals resisting payment of their proper water assessment. The State Engineer therefore strongly recommends the enactment of such legislation as may be necessary to have the various counties assume responsibility for the payment of salaries and expenses of the water masters serving within their borders. Funds for reimbursement of such expenditures should be raised by direct taxation on the areas served.

It is also recommended that more adequate legislation be enacted requiring installation of substantial control gates on dams and ditches when the State Engineer deems them necessary for the proper regulation of water-flow.

(d) Engineering Experimentation.

More than 90% of the water falling on the mountains in this State goes to waste because of lack of catchment and storage facilities. A portion of this water sinks into the gravel beds in the valleys, and can be recovered from the ground by pumping or from artesian wells. Exhaustive examinations and tests made under previous appropriations indicate possibilities of profitable land development from this source. Particular attention is called to the results of these investigations which are described under the title of "Ground Waters."

It is recommended that the appropriation of \$3,500 for this work be continued for another biennium, the results apparently justifying the necessary expenditures.

(e) Cooperative Appropriations.

For several sessions past the Legislature has, in cooperation with the Federal Government, made biennial appropriations of the sum of \$5,000 for stream measurements, and of the sum of \$4,000 for other irrigation investigations. The State Engineer urges the continuance of the first-named appropriation as further stream-gage readings are required to properly determine water rights.

It is recommended that the second-named appropriation of \$4,000 be discontinued, in view of the more pressing needs of other state activities.

The results obtained from these cooperative investigations are discussed in detail in this report under appropriate titles.

(f) Office Hours and Equipment.

It is recommended that the office hours of the State Engineer's office, which are at present under the law from 9 a. m. to 4:30 p. m., be changed to from 9 a. m. to 5 p. m., giving an increase equivalent to 154 work-hours or 22 working days per year. The large volume of work before the office makes it desirable to increase the working hours.

Fireproof equipment should be provided for protecting the water-right records of the office. More than fifteen thousand maps, proofs, permits, and applications are now filed in flimsy wooden cases. In case of loss by fire, the monetary cost of reproducing the maps alone would exceed a half million dollars. Reproduction of the proofs, applications, and permits would be almost impossible. It is therefore urgently recommended that the sum of \$5,000 be appropriated for the purchase of fireproof filing equipment.

HUMBOLDT RIVER

This stream follows a meandering course of more than one thousand miles in length and waters approximately one-third of the irrigated area of the State. The flow varies widely in amount, and the methods of irrigation practiced are more diverse than can be found on any other river in the world. These adverse physical factors, added to the hundreds of conflicting claims of rights and to the personal animosities resulting from fights over water, all combined to make the adjudication of the stream a problem of unusual perplexity and magnitude. The complex conditions naturally resulted in many vigorous contentions, both legal and otherwise, between the State Engineer's office and parties who deemed that their rights were being placed in jeopardy. The final outcome of this clash of ideas has been beneficial. Issues have been clarified and a better understanding of the vexing problems involved has been secured by all concerned. Through the organization and cooperation of several district water-users' associations there has been eliminated much of the bitterness caused by the filing and prosecution of formal contests.

Acting under the authority granted by the state water law, the Engineer and representatives of the various water-users' associations have compiled and issued uniform rules governing adjudication investigations. The questions at issue have been much simplified and it is believed that a firm foundation has been laid for a satisfactory and expeditious determination of rights.

More than 100,000 duty-of-water and stream-gage measurements have been taken and recorded for the purpose of obtaining information on which to base proper allotments of water. Every available agency of the Federal Government has been utilized in securing desired data. Reconnaissance surveys have been made for possible reservoir sites, results of which are discussed under the title "Cooperative Investigations." After the water rights are adjudicated, the answers to three questions of major importance must be determined before any marked development can occur. They are as follows:

1. Does a water supply exist over and above the adjudicated rights, sufficient to warrant construction of storage reservoirs and revision of irrigation systems?
2. Will the owners of all or part of the irrigated lands for which improvements are practicable be willing to organize their properties into districts, and bind themselves to pay for the cost of the improvements?
3. Do the crop and market conditions warrant the breaking up of the large holdings into smaller farm units, and can such be operated successfully?

An affirmative answer can probably be given to all of the questions, in which case the Humboldt territory can then economically support a much larger population than at the present time.

Special attention is called to the possibility of increasing the cultivated acreage by a combination of dry-farming and irrigation methods, such as practiced by some of the ranchers in the vicinity of Metropolis in Elko County.

CARSON RIVER

The adjudication of vested water rights on this source was begun by a former State Engineer, Mr. A. E. Chandler, who completed findings on the East and West Forks, and on the main Carson River from the confluence of the branches down to a point below Dayton in Lyon County. Certificates were issued to all appropriators named in the findings, which, however, cannot be regarded as final because they have not been passed upon by the courts.

Due to the fact that the rights of several appropriators had never been determined, serious litigation was threatened during the dry seasons of 1918, 1919, and 1920. The State Engineer therefore deemed it advisable to reopen and complete the adjudication proceedings in the manner as required by law in order to bring all appropriators into its findings, which are to be submitted to the court within the next few months. All steps preliminary to a court hearing have been completed.

As soon as the relative rights of the old appropriators are established, it will doubtless be advantageous and profitable to impound flood water on the upper branches of the Carson River. As a matter of public interest, this work should preferably be done and the benefits apportioned by a district organization, similar to that which is handling the storage undertakings on the Walker River. Detailed surveys and plans for the Upper Carson storage have been made by the United States Reclamation Service. Construction work should be aggressively pushed as soon as the Carson adjudication proceedings are completed.

WALKER RIVER

This is the first of the important stream systems of the State to have its water rights adjudicated and placed under the direction of the State Engineer as Water Commissioner. The people of the district are likewise the first in Nevada to heavily bond themselves for irrigation improvements through organization of an irrigation district. Too much credit cannot be given these progressive citizens for their pioneer work and excellent example to the rest of the State.

The Walker River Irrigation District includes all of the irrigable land in Mason Valley, East Walker Valley, Smith Valley and that portion of Antelope Valley lying in Nevada. These lands are now held by 480 owners who have an average holding of 373 acres per owner. With the improved protection and facilities which will be furnished by the proposed storage reservoirs, these holdings will probably be broken into smaller units and more intensively cultivated. In addition many thousand acres of fertile new land can be brought into cultivation. A large increase in population can reasonably be expected in this territory during the next decade.

A bond issue of \$918,500 has been authorized by almost unanimous vote of the land owners of the district, for the purpose of constructing

four reservoirs having a capacity of 158,000 acre-feet, for storage of surplus waters. The first unit will be built at Alkali Lake, a natural storage basin of 85,000 acre-feet capacity. The surplus water supply appears to be ample, the United States Geological Survey stream records indicating that an average of more than 250,000 acre-feet is wasted annually into Walker Lake. The experience and results gained in the operation of this project will be of great value in promoting interest in similar projects elsewhere in the State.

MUDDY RIVER

A finding of rights on the Muddy River was made in 1907 by a former State Engineer, Mr. Henry Thurtell. However, due to circumstances over which he had no control, these findings were not accepted by the water users and serious litigation ensued between the upper and lower river appropriators. In the spring of 1919, after a series of conferences with the Governor and State Engineer, the contending factions consented to a readjudication of their relative rights by the Engineer's office, based upon certain stipulations which were agreed upon at that time. The statutory proceedings were then instituted and in March, 1920, the Engineer submitted his findings to the District Court. A few minor modifications were made upon the exceptions of some of the parties at interest and on March 12, 1920, a final decree was entered by the court. The adjudication appears to be entirely satisfactory to the water users, whose rights have been thereby accurately defined.

The water in the Muddy River is all appropriated, but very considerable savings can be effected by improvement of the irrigation works of diversion and distribution, details of which have been studied and reported on by representatives of the State Engineer's office.

The soil of the Muddy Valley is one of the most fertile in the State, and the climate is favorable for heavy crops, due to the long growing season. If improved marketing facilities and water distribution systems can be arranged, there is no reason why this valley should not support a comparatively dense population. The water users appear to be well organized and under intelligent leadership. It is believed that the needed improvements will be made as rapidly as financial conditions permit.

VIRGIN RIVER

The agricultural lands lying along the Virgin River in Nevada are in a most backward state of development in spite of their great fertility and very favorable climatic conditions. This lack of development is due to three principal causes: First, the sudden high and destructive river floods, the stream-flow sometimes varying from 40 second-feet to 11,000 second-feet in three days' time; second, the distance from consuming markets and lack of good roads; and, third, the inability of the land owners to finance the cost of the substantial irrigation structures required to withstand floods.

From the fragmentary records which are available, it appears that more than 150,000 acre-feet of water are annually discharged by the Virgin into the Colorado, which water would be available for appropriation if it could be economically diverted and impounded for beneficial use. On account of the apparent possibilities for land development on this source, the State Engineer made a special study

of the land and water conditions on two areas—one in the vicinity of Bunkerville and Mesquite, and the other below the confluence of the Muddy and the Virgin near St. Thomas. The Engineer believes that both areas are susceptible of very profitable development, and upon his recommendation the water users of the former area have organized themselves into an irrigation district comprising 10,240 acres of land. Of this amount 3,380 acres are already irrigated, leaving 6,860 acres of land open for entry under the project. The present diversions are from the soft silt banks of the river, and are washed out by floods practically every year.

The permanent improvements recommended consist of a concrete diversion dam on the Arizona side at a rocky portion of the river channel; the conduct of the water for seven miles through Arizona to the town of Mesquite, thence across the state highway bridge to Bunkerville. The necessary distribution laterals can be cheaply run from these points. It is estimated that the lands in the district can thus be watered at a very low cost.

Through arrangements made with the State Highway Commission and Board of Commissioners of Clark County, the new highway bridge contains the necessary trusses and supports for carrying the water flumes for the proposed new irrigation system. The project is now at a standstill on account of the inability of the district to finance itself through sale of irrigation bonds. It is believed that private capital can profitably interest itself in this meritorious enterprise.

In order to stabilize the water rights of the appropriators, the State Engineer has proposed to the officials of Utah and Arizona that an early joint adjudication of the stream system be undertaken in order to determine the amount of water available for new appropriation.

TRUCKEE RIVER

The Truckee River annually discharges more than 800,000 acre-feet of water, and exclusive of the Truckee-Carson Reclamation project, irrigates a producing area of approximately 30,000 acres. A very large amount of the water goes to waste each year in Pyramid Lake and Winnemucca Lake.

Development on this source has been seriously hampered, as on other streams, by the difficulties encountered in the determination of relative rights on the system. Additional complications are added by the claims of the riparian owners around Lake Tahoe. Owing to the large excess of water usually available, the necessity for an accurate determination of the rights of appropriators was not apparent to the water users themselves, many of whom naturally looked upon all adjudication proceedings as an unwarranted attempt to deprive them of their rights. Through a suit commenced in the Federal Court in 1913, it is expected that determination of the rights will be reached at some comparatively early date.

Following three years of abnormally low precipitation on its drainage basin, the months of July and August, 1920, found the Truckee River with one of the scantiest stream-flows ever recorded. The impending loss of crops on some areas, particularly in the vicinity of Fernley and Hazen, led to a strong agitation on part of the affected ranchers for a release of additional waters from Lake Tahoe into the river. The movement was vigorously resisted by the Tahoe riparian

owners and the Attorney-General of California, chiefly through magazine and newspaper propaganda alleging that the Nevada interests sought to destroy the scenic beauties of the lake for a season's profits. The controversy culminated in a hearing held in Reno on July 30, 1920, before Colonel E. W. Winslow of the War Department. At this time the State Engineer presented the case of the Nevada ranchers, supported by the testimony of numerous witnesses, including Governor Boyle and representatives of the affected farmers. The outcome of the hearing was that a better understanding of the situation was acquired by all concerned, and it was made clear that Nevada had no desire to make the lake a "yawning abyss," as claimed by imaginative writers of Tahoe propaganda.

Following the hearing, Governor Boyle initiated a conference of the Nevada and California interests which was held in San Francisco on August 5 and 6. At this meeting the California representatives displayed a spirit of amity and fair play, from which it is hoped that a satisfactory settlement of the Tahoe controversy can finally be arranged.

A series of conferences between the conflicting interests have since been held and a substantial agreement has been reached on many contested points.

On August 11, 1920, the State Engineer was appointed Water Master for the Truckee River by the Federal Court of the Nevada District, for the purpose of delivering any extra water-flow obtained from Lake Tahoe, to the Fernley and Hazen ranches suffering from a shortage of water. The Truckee Meadows ranchers generously cooperated in the work, and the suffering crops were saved. This threatened water shortage strongly emphasizes the necessity of constructing additional impounding reservoirs on the Truckee River if we expect to properly utilize the opportunities for development offered by this splendid stream of water.

Rivers of similar volume of discharge have been made to irrigate four times as great an area of land as is watered from the Truckee, notably the Kings River in California. After the relative rights of the present appropriators are settled, the State may confidently expect a large increase of cultivated area on the Truckee stream system.

COLORADO RIVER

This stream is the third largest in the United States and passes through Nevada territory for a distance of more than 100 miles. The annual discharge is nearly 15,000,000 acre-feet of water, hardly a drop of which is beneficially used in this State.

One of the best undeveloped power-sites in America lies at Boulder Canyon in Clark County. About 200,000 horsepower can be developed at this point, at a probable cost of less than \$50,000,000. The attention of the office was first brought to this great project through the application of Mr. Henry C. Schmidt for a permit to utilize the waters of the Colorado for power purposes. Subsequent investigations revealed the magnitude of the opportunity for adding to the wealth of Nevada from this source, and, upon the report of the State Engineer, a commission of citizens was appointed by the Governor to look after the interests of the State in the matter. The commission consists of Messrs. E. W.

Clark, E. W. Griffith, C. P. Squires, Harley Harmon, O. T. Johnson, Jr., Levi Syphus, R. W. Martin, and J. G. Scrugham, and has met and adopted certain recommendations which will be presented to the Legislature in a separate report.

The State Engineer desires to emphasize the necessity for a clear establishment of the rights of Nevada on this source if we are to profit from its development. The project of impounding these waters has now attracted the attention of large financial and political interests who give every indication that they intend to ignore this State entirely in the apportionment of benefits to be derived. As an example it should be noted that the Federal Water Power Commission claims full jurisdiction and is reported to have recently granted the Southern California Edison Company a preliminary permit to develop 250,000 horsepower, presumably on Nevada and Arizona territory. The State Engineer is arranging to attend a conference to be held in January or February, 1921, with engineers from Arizona, Colorado, Utah, New Mexico, and California, in order that a systematic organization may be perfected to protect the rights of the interested States. This organization will work in cooperation with the Nevada Commission appointed by Governor Boyle.

MINOR STREAMS

1. A finding on relative rights has been made on the waters of Clear Creek in Pershing County and submitted to the District Court at Lovelock. The finding was made a basis for a decree fixing the water rights of the various users on the creek.

2. Currant Creek, in Nye County, has also been adjudicated, and complete findings presented to the District Court at Tonopah for appropriate action.

3. Rice Creek, in Elko County, is another minor stream recently adjudicated. Findings thereon have been made and will soon be submitted to the District Court at Elko as the basis for a court decree.

4. The protracted litigation over the waters of Duckwater Creek in Nye County is a matter of common knowledge. During the summer of 1919 serious controversies again arose, which culminated in a hearing before the District Court at Tonopah in October, 1919. At this time the State Engineer proposed to the contestants that he be allowed to undertake the handling of the situation for the following year, and with the further understanding that he would later make definite recommendations to the court covering the points in dispute, particularly with reference to the normal flow of the creek. The proposal was agreed to, and an appropriate stipulation was prepared and signed by the parties of interest. Due to the severe animosities engendered by previous litigation it was found very difficult to obtain any general unanimity of agreement on the points at issue. The controversies on this source are primarily due to a shortage of water caused by excessive and unnecessary seepage and evaporation losses. The creek channel should be straightened and kept clear of vegetation and other obstructions. Suitable works of control must be installed. Adjacent bogs should be drained, and an adequate canal excavated to connect the Big Warm Spring with Duckwater Creek. If the relative allotments of water are determined and the State Engineer is given authority by the court and the water users to make the above-mentioned improvements,

it appears probable that practically all of the difficulties will be eliminated and the expensive litigation ended.

5. Siegel and Six-Mile Creeks are two other small sources of water, which are now undergoing adjudication in accordance with the procedure prescribed by law.

GROUND WATERS

Practically all of the normal flow of the surface streams of the State is appropriated, either under old vested rights, or by permits from the State Engineer's office. Irrigation of new lands must be largely secured either from waters impounded during the flood seasons or from supplies of underground waters.

The development of ground waters in Nevada has been greatly hampered by a lack of knowledge of what conditions were essential for economic success. Through means of small appropriations made by the 1915, 1917, and 1919 Sessions of the Legislature and the observations and assistance of a number of interested individuals, notably Messrs. F. M. Jenifer, Victor Barndt, and E. E. Free, a quantity of pertinent information has been obtained which is here presented.

As preliminary to the discussion it may be stated that the topography of Nevada is made up of a series of trough-like valleys lying between mountain ranges. These valleys are usually bowl-shaped and are filled with alluvial debris eroded from the mountains. It has been definitely established that economic quantities of ground water can only be obtained from the buried stream channels in the alluvial deposits. The streams of water which descended the mountain slopes and brought about the alluvial valley filling have been extremely variable in position. When the stream-bed remained stationary for a considerable length of time, there was deposited a quantity of gravel along its course which was easily pervious to water. As the channels shifted, the old stream-beds were covered with hardpan, clay, or silt, and became lost to sight. In all valleys investigated there appear to be many of these abandoned stream channels of gravelly nature, all leading from mountain slopes toward the center of the basin. Water which falls in the mountains in the form of rain or snow descends and enters the upper ends of these buried channels through the coarse talus at the foot of the mountains. If clay and hardpan beds surround the ancient stream channels further down the slope, artesian pressure is generally developed. Every effort should be made to encourage exploration for these artesian pressure zones. They are most likely to be found in an area intermediate between the foot of the mountains and the centers of the bowl-shaped valleys. The areas nearest the mountains are best for pumping-water explorations, but rarely have the clay or hardpan seal necessary to produce artesian conditions. The areas in the centers of the valleys generally have the stream channels either pinched out or too choked with fine detritus to carry an adequate quantity of water for economic use. The depth and location of the old stream channels can only be determined by exploration, but our experience indicates that certain localities are much more favorable than others. Broad valleys having gentle slopes, and, with a sufficient watershed, are very promising places for exploration. Given a good soil, favorable climate, and accessibility to markets, which can be found in several places, it appears that many underground water areas in Nevada can be profitably developed. Substan-

tially every valley of any size in the State has been investigated by the Engineer's office. In the favorable classification given below, the five factors of topography, watershed, soil, climate, and accessibility were considered.

FAVORABLE VALLEYS

Las Vegas,	Amargosa,	Black Rock,
Dixie,	Carson Sink,	Pahrump,
Walker River,	Big Smoky,	Columbus,
Ralston,	Railroad,	Ruby,
Lamoille,	Diamond,	Spring,
Gibson,	Fish Lake,	Indian Spring,
Steptoe,	Grass,	Quinn River.

Of the valleys named, the Amargosa has probably the largest drainage basin and the most favorable climate. The soil is sandy and generally of a volcanic origin. To date drillings have failed to develop artesian water although a ranch operated by the Tonopah and Tidewater Railroad is successfully irrigated by pumped water. The Carson Sink and Las Vegas and Lamoille Valleys also offer exceptionally favorable conditions—the first two for artesian water, and the last named for pumping water. The State Engineer's office has cooperated with the Tonopah and Tidewater Railroad Company, the Board of County Commissioners of White Pine County, and a large number of private individuals in conducting tests and investigations of pumping and drilling costs with view of determining the limits of profitable operation. It is planned to publish the detailed results and conclusions at an early date if the engineering experimentation appropriation is continued.

In conclusion, special attention is called to the terms of the so-called Pittman Act, which offers favorable conditions for the acquirement of public lands in Nevada through development of underground waters. Actual operations under the Act are greatly hampered by a ruling of the Secretary of the Interior and the Commissioner of the General Land Office which forbids the pooling of small interests and their mutual sharing in waters which might be developed from a productive source. Under present conditions the speculative element encountered in underground water explorations is too great to warrant its being undertaken by individuals of limited financial resources. If several persons were allowed to maintain a jointly owned and operated pumping plant, drilling rig, etc., for the benefit of their entries, the risks would be minimized and the chances for success greatly increased. The State Engineer argued this point of view before the Secretary of the Interior and the Commissioner of the General Land Office, but was overruled on ground that cooperative explorations were not permitted by the law.

STOCK-WATERING RIGHTS

The Engineer's office now has pending several hundred applications for permits to use excess water from small sources upon which there exist prior stock-watering rights.

Under the law the Engineer has no specific authority to deny such applications, although the new applicant may ruin the range of the old user. Most of the applications mentioned are from stockmen who desire to get a foothold on public land ranges now used by other persons.

Action on this class of applications is being withheld pending the

formulation of a better range policy by the Government and State. While the office has no desire to assist any class of individuals in maintaining a monopoly of the public range, yet an obvious injustice would be perpetrated if additional stock-watering rights were granted on every spring which showed any unutilized water, and for which application was made.

Such a policy would be particularly disastrous to the small stockman who can only operate advantageously in the vicinity of his home ranch. Itinerant herds would speedily ruin his range and then pass on to other fields.

No recommendations as to future policy will be made at this time, but the Engineer will present the subject for discussion at various stockmen's meetings with the hope of obtaining a sound basis for action.

LAND-SETTLEMENT LEGISLATION FOR SOLDIERS

The movement to secure adequate land-settlement legislation for the benefit of returning soldiers was initiated by Secretary Franklin K. Lane soon after the signing of the Armistice in 1918.

Due to energetic work on the part of the Interior Department, thirty-one States, including Nevada, shortly afterwards made provisions to cooperate with the Federal Government under the terms of a proposed Soldier Settlement Act which was introduced in Congress in the spring of 1919. Although the bill was sponsored by the Republican floor leader, Mr. Mondell, and was favorably reported from the Public Lands Committee, it failed to receive the necessary backing from the public or the returned soldiers, and was not brought to a vote. The enactment of the measure into a law would have been of very great benefit to the development of Nevada and other States of scant population, but the adverse influence of the more densely populated communities was too strong to be overcome.

At the Minneapolis convention of The American Legion held in November, 1919, the principle of the proposed legislation was endorsed and the State Engineer was selected to serve as a member of a Legion committee which redrafted the Mondell Land Settlement Bill and added other optional features covering home aid, vocational training, paid-up insurance, and adjusted compensation. Acting as spokesman for the American Legion organization, the State Engineer presented their proposed measure to Congress on March 24, 1920, and made a comprehensive argument in its favor before the full Ways and Means Committee. After making some modifications this committee reported the bill favorably, and it was passed by the lower House of Congress on May 29, 1920, by a vote of 289 to 92, in the face of strong opposition from powerful financial and political interests.

The matter is now in the hands of the Finance Committee of the Senate who are understood to be unfavorable to such legislation on account of the heavy expenses involved. However, a strong effort is now being made by The American Legion and other organizations to secure favorable action before the closing of the Sixty-Sixth Congress on March 4, 1921.

The State Engineer has received hundreds of applications from capable returned soldiers who desire to settle in Nevada, provided that they can be given preferential rights on public lands and adequate financial assistance until the raw lands can be made productive.

The British Colonies have invested heavily in the matter of soldier-land settlement, Canada alone having granted about a half million acres of land to 12,000 men, and loaned them an average of \$1,000 each to pay for stock and improvements.

A Nevada Soldier Settlement Board was authorized and organized under the terms of an Act of the Legislature of 1919. A substantial appropriation was made, but no part of it is available until a similar amount is appropriated by the Federal Government.

A committee of soldiers representing the Nevada Department of The American Legion is now making a study of the possibilities of the situation. It is probable that this committee will cooperate with the State Engineer in making further recommendations to the Governor and incoming Legislature with the view of establishing soldier-settlement units in practicable locations in the State. The project is very meritorious, and has proven to be successful in other States and countries.

IRRIGATION AND DRAINAGE DISTRICTS

Attention is here called to the fact that in many cases, irrigation and drainage projects within the State may be profitably undertaken by water users under the terms of the "Nevada Irrigation District Act," or the "Nevada Drainage District Law." Interested parties may obtain full information regarding these laws upon application to the State Engineer's office. A number of irrigation and drainage districts have been successfully organized during the past two years.

COOPERATIVE INVESTIGATIONS

1. Stream Measurements.

The appropriations for stream-measurement work have remained practically the same during the biennium ending December 31, 1920. Prices for all kinds of labor and material as well as for transportation and field expenses have continued abnormally high. It has, therefore, been impossible to take up any appreciable amount of new work.

Contrary to conditions existing over most of the intermountain region the run-off of Nevada streams seems to have been less in 1920 than in 1919. This is particularly true of the Humboldt river system. The run-off at Palisade during 1920 was only one-half of the mean flow for the past nine years; although it was about one-third greater than for the exceedingly low years of 1915 and 1918.

Stations were maintained during the biennium on the following streams:

- Humboldt River at Palisade, Nevada.
- Humboldt River at Comus.
- Humboldt River near Oreana.
- Humboldt River near Lovelock.
- Star Creek near Deeth.
- Marys River at Mala Vista ranch near Deeth.
- Secret Creek near Halleck.
- Lamoille Creek near Lamoille.
- Lamoille Creek near Halleck.
- North Fork of Humboldt River at Devils Gate near Halleck.
- South Fork of Humboldt River near Elko.
- Maggie Creek at Carlin.
- Rock Creek near Battle Mountain.
- H. L. I. L. & P. Co.'s feeder canal near Mill City.
- H. L. I. L. & P. Co.'s outlet canal near Humboldt.
- Truckee River at Reno.

Carson River at Empire.
 Carson River near Fort Churchill.
 West Fork of Carson River at Woodsfords, Cal.
 Walker River near Wabuska.
 Walker River at Schurz.
 West Walker near Coleville.
 West Walker near Wellington.
 West Walker at Hudson.
 Bruneau River near Rowland, Nevada.
 Owyhee River near Gold Creek.
 Owyhee River near Owyhee.
 Jack Creek near Tuscarora.

Complete records for publication are furnished by the United States Reclamation Service for the stations on Carson River at Empire and near Fort Churchill.

The cost of maintaining the stations on Owyhee River near Gold Creek and near Owyhee and on Walker River near Wabuska, is paid by the United States Indian Service.

Acknowledgments are also due to private companies and individuals for furnishing gage-height records at several stations.

Expenditures for carrying on the work during the biennial period were made from the several funds as follows:

State of Nevada.....	\$5,000.00
U. S. Geological Survey.....	5,450.00*
U. S. Indian Service.....	1,150.00

2. Irrigation Investigations.

The expenditures under this appropriation of \$4,000 were divided under two heads—Humboldt River Investigations, and Summary of Duty of Water Measurements. Under the former head a cooperative agreement was made with the United States Reclamation Service whereby the possibilities of irrigation development on the Humboldt River were studied and made the subject of a comprehensive report. The principal conclusions reached were:

(a) No additional acreage on the Humboldt River should be allowed water rights unless adequate storage reservoirs are constructed.

(b) The waste water flowing into the Humboldt Sink which might be impounded, is a quantity varying from 4,000 to 350,000 acre-feet per year, or an average of about 88,000 acre-feet.

(c) From the best information available an average of approximately 463,000 acre-feet of water per year flows into the Humboldt River Basin, for the proper control of which four storage reservoirs should be constructed.

(d) It is recommended that the reservoirs be located as follows:
 North Fork, 100,000 acre-feet capacity.
 South Fork, 150,000 acre-feet capacity.
 Humboldt-Lovelocks, 50,000 acre-feet capacity.
 Oreana, 118,000 acre-feet capacity.

The Humboldt-Lovelocks reservoir is already built and should be enlarged to the designated capacity of 50,000 acre-feet. The first

*Does not include money spent by the Washington office for general supervision and reviewing data for publication, nor for the cost of publishing the stream-flow records in the annual Water Supply papers.

two reservoir sites named above will primarily protect the upper river water users, while the two last named will primarily protect the lower river water users. Both North and South Fork sites will have their dams located in rocky canyons with apparently solid foundations. The Oreana dam-site formation is alluvial, the foundation stability of which can only be determined by drilling.

(e) In order of importance the reservoir sites should be developed as follows: Humboldt-Lovelock, South Fork, North Fork Oreana.

(f) For the development of new lands, the South Fork reservoir will give the most economical storage, based on costs per acre-foot.

(g) A summary of duty of water measurements along the Humboldt River shows that an average of approximately three acre-feet of water are required to be used for cultivated crops, one and a half acre-feet for meadow pasture, and less than three-fourths acre-feet for sagebrush pasture. However, these figures vary considerably with the character of the soil, climate, and topography of the land.

Detailed reports on the above investigations are available in the office of the State Engineer.

COOPERATIVE SNOW SURVEYS

The system of cooperative snow surveys was organized in 1919 by informal agreement between the States of Nevada and California to attempt to complete and give practical application to the plan of snow surveying and forecasting of stream-flow developed by the Nevada Agricultural Experiment Station. The original plan embraced only interstate streams, but was later extended by legislative appropriation to include all snow-fed streams in the State. The total appropriation for the biennium was \$1,500.

During the two-year period snow surveys have been regularly conducted in the Tahoe, Carson, Walker, and Humboldt Basins and forecasts of probable run-off have been issued in April, May and June of each year.

Dr. J. E. Church, Jr., of the University of Nevada has given many years of painstaking attention to this subject and whatever beneficial results may be obtained from the snow forecasts will be due almost entirely to his conscientious work. It is recommended that the appropriation be continued during the coming two-year period.

The following problems will require particular attention: (1) The excessive but infrequent shrinkage in the general run-off indicated by the snow survey; (2) the occasional expansion and shrinkage of the expected run-off below diversions; (3) the training of local men to make snow surveys.

WATER COMMISSIONERS

The problems that a Water Commissioner has to cope with in the proper and equitable distribution of water are exceedingly involved at times, more particularly on the streams where there is a laxity in the installation of suitable measuring and control devices.

During the two-year period just completed the following men have acted as commissioners on various stream systems of the State. Each one has, with the occasional assistance of this office, given satisfaction

to the water users in his respective district. Detailed reports of the activities of the Water Commissioners are on file in the State Engineer's office.

Water Commissioners, 1919

<i>Source</i>	<i>Commissioner</i>	<i>Appointed</i>
Carson River:		
East Fork.....	Geo. Allerman.....	June 15, 1919
West Fork.....	B. R. Russell.....	June 15, 1919
Main River (Lyon County).....	Orin DuBols.....	Aug. 27, 1919
Main River (Ormsby County).....	John G. Ellis.....	July 11, 1919
Main River (Lyon County).....	Edward Lemonte.....	July 25, 1919
Main River (Lyon County).....	Zenas Walmsley.....	July 19, 1919
Walker River:		
Main River.....	J. C. Kennedy (Supervising).....	June 28, 1919
Main River.....	A. A. Schole.....	July 3, 1919
Main River.....	Hans C. Jessen.....	June 27, 1919
Main River.....	Donald Warren.....	June 27, 1919
Main River.....	Geo. Plummer, Jr.....	June 27, 1919
Greenwood Ditch.....	J. C. Mathews.....	June 11, 1919
Fox Ditch.....	Harvey LaRue.....	Aug. 18, 1919
Mickey Ditch.....	C. D. Bovard.....	June 23, 1919
Fox Ditch.....	Albert Hayes.....	May 3, 1919
Duckwater Creek.....	Clarence Johnson.....	April 15, 1919
Current Creek.....	Clarence Johnson.....	April 15, 1919
Muddy River.....	H. T. McQuiston.....	June 1, 1919
South Fork Humboldt River.....	Thos. King.....	July 1, 1919
Lamolle Creek.....	J. H. Hayward.....	June 20, 1919

Water Commissioners, 1920

Carson River:		
East Fork.....	A. A. Schole.....	June 15, 1920
West Fork.....	B. R. Russell.....	June 10, 1920
Main River (Lyon County).....	Louis Basso.....	Aug. 9, 1920
Main River (Lyon County).....	Chas. Leicham.....	Aug. 17, 1920
Main River (Ormsby County).....	James N. Reid.....	July 27, 1920
Walker River:		
Main River.....	G. W. Malone (Supervising).....	May 18, 1920
Main River.....	Geo. Plummer (Part time).....	April 13, 1920
Main River.....	Hans Jessen (Part time).....	April 13, 1920
Main River.....	A. A. Schole (Part time).....	May 18, 1920
Main River.....	Donald Warren (Part time).....	May 12, 1920
Main River.....	A. J. Aikens (Part time).....	June 1, 1920
Main River.....	Lee Scott.....	June 1, 1920
Mickey Ditch.....	C. D. Bovard.....	Aug. 4, 1920
Fox Ditch.....	S. O. Stallard.....	April 1, 1920
Greenwood Ditch.....	H. Gorssline.....	May 8, 1920
Jasper-Daniels Ditch.....	Will Depaoll.....	June 1, 1920
Duckwater Creek.....	O. W. Layman.....	May 12, 1920
Current Creek.....	O. W. Layman.....	May 15, 1920
Muddy River.....	J. V. Mueller.....	April 10, 1920

CAREY ACT

Under the law the State Engineer is an ex officio member of the Commission of Industry, Agriculture and Irrigation, having to do with the administration of the so-called "Carey Act," which was designed to promote the reclamation and settlement of arid lands.

Although Nevada is entitled to select two million acres of arid lands for withdrawal and segregation under this Act, no applications for such segregations have been received during the past two years. In past years segregations of about 613,000 acres have been applied for, but of this amount only the segregation of the Pacific Reclamation Company, amounting to 3,388 acres, has been finally approved.

The causes of the general failure of Carey Act projects in this State are primarily due to the fact that they were ill financed and undertaken with no knowledge of the technical difficulties involved. In order for such a project to be successful a thorough preliminary investigation of water supply, soil and marketing conditions is absolutely essential, even though the necessary finances have been provided.

OFFICE FINANCES
Segregated Expenditures from Appropriation for Support of Irrigation During Period Covered by this Report

Month	Appropriated by Legislature	Traveling expense	Salaries	General expense	Stationery	Equipment	Extraordinary	Totals
1919								
January.....	\$25,000.00	\$45.40	\$607.00	\$11.13	\$30.00			\$693.53
February.....		45.40	560.00	7.86				613.26
March.....		83.80	535.00	5.89				634.69
April.....		412.35	965.00	14.14	41.50	\$944.10	\$122.70	2,609.99
May.....		202.47	795.00	23.20	43.20			1,060.87
June.....		378.43	725.00	17.69	108.20			1,241.82
July.....		681.80	829.15	\$7.72	65.70		106.00	1,669.37
August.....		78.21	715.00	22.84	50.00	22.11		888.16
September.....		229.07	665.00	23.06	62.53		30.00	1,014.70
October.....		193.50	630.00	27.37	38.55	42.86	10.00	889.52
November.....		521.68	750.00	15.93	63.73		10.00	1,409.20
December.....		379.68	700.00	17.85	27.00	4.85	10.00	1,139.38
Totals.....	\$25,000.00	\$3,201.99	\$3,446.15	\$234.57	\$537.56	\$1,033.92	\$300.20	\$13,764.49
1920								
January.....		\$197.08	\$725.00	\$18.42	\$12.55	\$76.06	\$21.80	\$1,051.00
February.....		363.13	899.65	16.71	21.55		20.00	1,311.14
March.....		440.13	775.00	22.65	56.44	35.15	575.80	1,905.17
April.....		637.66	633.00	23.25		1.00		1,294.90
May.....		268.78	600.00	10.57	94.52	769.70	35.40	1,763.97
June.....		194.78	672.00	15.55	16.50		10.00	908.94
July.....		144.48	755.00	16.80		23.85		941.13
August.....		175.49	625.00	\$7.16	1.40		20.00	659.05
September.....		249.47	375.00	13.98	17.20		10.00	665.65
October.....		258.50	145.00	12.68	8.55			425.03
November.....			200.00	8.98				208.98
December.....		60.40	28.37	12.13	4.55			105.55
Totals.....		\$2,969.59	\$3,224.02	\$208.89	\$253.96	\$936.75	\$988.00	\$11,245.51
Grand totals.....	\$25,000.00	\$6,191.58	\$14,670.17	\$443.55	\$771.52	\$1,929.57	\$993.20	\$25,000.00

REPORT OF STATE ENGINEER

Fees Received and Disposition of Same

Month	Fees received	Monthly fees deposited with state treasurer	Paid for publication fees	Paid as refund on canceled applications	Balance held for publication fees	Balance held for recording certificates	Totals
1919							
Balance, 1918.....	\$4,612.16				\$850.00	\$3,762.16	
January.....	884.90	\$519.90	\$400.00	\$30.00	780.00	8,767.16	
February.....	576.70	306.70	180.00	10.00	790.00	8,787.16	
March.....	729.10	359.10			1,140.00	8,897.16	
April.....	1,077.32	682.32			1,580.00	8,822.16	
May.....	1,085.00	560.00	860.00	110.00	1,010.00	8,847.16	
June.....	1,519.60	784.60			1,700.00	8,892.16	
July.....	1,199.50	574.50			1,680.00	8,987.16	
August.....	1,149.27	639.27	570.00	10.00	2,180.00	8,967.16	
September.....	1,589.00	624.00			3,040.00	4,012.16	
October.....	1,081.08	586.08			1,530.00	4,057.16	
November.....	1,810.40	735.40	1,700.00	260.00	2,070.00	4,082.16	
December.....	1,022.24	487.24	880.00		1,640.00	4,177.16	
Totals.....	\$17,686.27	\$6,839.11	\$4,580.00	\$440.00	\$1,640.00	\$4,177.16	\$17,686.27
1920							
Balance, 1919.....	\$5,817.16					\$4,177.16	
January.....	881.80	\$371.80	\$670.00		\$1,640.00	4,237.16	
February.....	1,128.40	318.40	400.00		1,280.00	4,237.16	
March.....	1,178.40	348.40		\$260.00	1,440.00	4,237.16	
April.....	1,785.00	855.00	780.00		1,780.00	4,237.16	
May.....	1,326.90	782.90		10.00	1,800.00	4,237.16	
June.....	1,164.70	680.70	710.00		1,800.00	4,237.16	
July.....	791.00	471.00	180.00		1,710.00	4,237.16	
August.....	563.20	313.20	580.00		1,380.00	4,302.16	
September.....	1,110.80	466.80		220.00	1,480.00	4,302.16	
October.....	890.80	586.80		50.00	1,780.00	4,307.16	
November.....	816.60	496.60	1,080.00	50.00	1,010.00	4,317.16	
December.....	448.60	228.60	260.00	40.00	980.00	4,317.16	
Totals.....	\$16,373.16	\$5,728.00	\$4,470.00	\$630.00	\$980.00	\$4,317.16	\$16,373.16

REPORT OF STATE ENGINEER

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Segregated Statement of Fees Collected by State Engineer from January 1, 1919, to December 31, 1920, Inclusive

Month	Fees received	Proof of appropriation	Applications		Issuing and recording permits	Proof of commencement of work	Proof of completion of work	Proof of application of water to beneficial use	Protests	Clerical work
			Publication	Fees						
1919										
January	\$834.90	\$5.00	\$310.00	\$165.00	\$224.40	\$13.00	\$15.00	\$39.00	\$11.00	\$52.50
February	576.70	20.00	250.00	135.00	83.20	5.00	5.00	2.00	4.00	62.50
March	729.10	20.00	350.00	225.00	38.60	10.00	11.00	4.00	18.00	54.50
April	1,077.32	15.00	400.00	200.00	141.82	24.00	6.00	13.00	211.00	66.50
May	1,085.00	25.00	450.00	245.00	168.80	71.00	19.00	13.00	8.00	35.20
June	1,519.60	45.00	690.00	365.00	190.80	62.00	47.00	14.00	13.00	92.80
July	1,199.50	75.00	550.00	275.00	90.00	40.00	54.00	18.00	12.00	85.50
August	1,149.27	45.00	510.00	255.00	167.27	25.00	23.00	21.00	29.00	79.00
September	1,539.00	45.00	870.00	455.00	35.00	16.00	24.00	15.00	19.00	60.00
October	1,081.08	45.00	450.00	225.00	235.08	4.00	23.00	14.00	8.00	77.00
November	1,310.40	35.00	540.00	270.00	324.40	11.00	35.00	83.00	10.00	52.00
December	1,022.24	85.00	450.00	265.00	136.24	5.00	12.00	22.00	13.00	35.00
Totals	\$13,074.11	\$415.00	\$5,520.00	\$3,120.00	\$1,842.61	\$286.00	\$274.00	\$208.00	\$356.00	\$752.50
1920										
January	\$831.80	\$80.00	\$400.00	\$220.00	\$46.80	\$6.00	\$25.00	\$15.00	\$22.00	\$36.00
February	628.30	50.00	310.00	185.00	63.80	1.00	4.00	2.00	5.00	57.50
March	1,178.40	50.00	410.00	205.00	490.40	2.00	1.00	13.00	9.00	69.00
April	795.00	10.00	430.00	245.00	45.00	11.00	6.00	9.00	5.00	34.00
May	1,392.90	78.00	600.00	320.00	377.40	16.00	14.00	35.00	10.00	55.50
June	1,150.70	70.00	470.00	285.00	154.70	78.00	25.00	27.00	9.00	91.00
July	791.00	40.00	370.00	205.00	74.00	39.00	18.00	11.00	5.00	53.00
August	563.20	285.00	210.00	125.00	50.20	31.00	15.00	11.00	11.00	30.00
September	1,110.80	5.00	390.00	215.00	11.80	41.00	14.00	9.00	12.00	153.00
October	850.80	5.00	260.00	150.00	290.80	27.00	18.00	34.00	6.00	60.00
November	816.50	10.00	330.00	185.00	152.50	6.00	20.00	14.00	11.00	98.00
December	448.60	10.00	210.00	125.00	61.60	3.00	5.00	13.00	1.00	18.00
Totals	\$10,556.00	\$440.00	\$4,390.00	\$2,465.00	\$1,789.00	\$261.00	\$165.00	\$185.00	\$106.00	\$755.00
Balance from 1918	\$4,612.16									
Grand totals	\$28,242.27	\$855.00	\$10,210.00	\$5,585.00	\$3,631.61	\$547.00	\$439.00	\$393.00	\$462.00	\$1,507.50

REPORT OF STATE ENGINEER

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Segregated Expenditures from Appropriation for Support of Cooperative Water Resource Branch, United States Geological Survey

Month	Appropriated by Legislature	Traveling expense	Salaries	General expense	Totals
1919					
January	\$5,000.00	\$3.55			\$3.55
February		47.45	\$236.24		342.69
March		127.90	182.00		259.90
April		150.16	138.00		288.16
May		110.55	367.67	\$3.47	471.69
June		12.35		8.66	21.01
July		182.10	18.00	6.35	206.45
August		19.36	272.67	19.86	311.89
September		88.50		10.75	99.25
October		109.79		17.70	127.49
November		70.20	267.77	61.20	399.17
December					
Totals	\$5,000.00	\$926.91	\$1,491.35	\$127.99	\$2,536.25
1920					
January		\$162.65		\$4.25	\$166.90
February		27.25	\$165.00		182.25
March		23.60	327.13		360.73
April		5.00			5.00
May		62.08		.30	62.38
June		152.60	326.59		479.19
July		142.21	49.00	6.25	197.46
August					
September		146.33	303.50	10.50	460.33
October		66.40		19.64	86.04
November					
December		81.37	400.35	1.75	483.47
Totals		\$559.49	\$1,561.57	\$42.69	\$2,463.75
Grand totals	\$5,000.00	\$1,786.40	\$3,042.92	\$170.68	\$5,000.00

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Segregated Expenditures from Appropriation for Support of Cooperative Irrigation Investigations

Month	Appropriated by Legislature	Traveling expense	Salaries	General expense	Stationery	Equipment	Extra-ordinary	Totals
1919								
January	\$4,000.00							
February								
March								
April								
May								
June		\$72.73	\$270.00					\$342.73
July		105.58	350.00					455.58
August		312.21	475.00					787.21
September		140.75	220.00					360.75
October			200.00					200.00
November		151.45	200.00	\$26.46				\$377.91
December		74.70	203.00	.50			\$46.60	\$324.80
Totals	\$4,000.00	\$947.42	\$1,918.00	\$26.96		\$965.00	\$46.60	\$3,903.98
1920								
January								
February								
March								
April					\$16.02			\$16.02
May								
June								
July								
August								
September								
October			\$30.00					\$30.00
November								
December								
Totals			\$30.00		\$16.02			\$46.02
Grand totals	\$4,000.00	\$947.42	\$1,948.00	\$26.96	\$16.02	\$965.00	\$46.60	\$4,000.00

Segregated Expenditures from Appropriation for Support of Engineering Experimentation

Month	Appropriated by Legislature	Traveling expense	Salaries	General expense	Equipment	Totals
1919						
January.....	\$3,500.00					
February.....						
March.....						
April.....		\$67.70	\$76.00			\$142.70
May.....		213.96	190.00	\$291.65		1,095.61
June.....		213.20	150.00	190.00		660.25
July.....		302.72	150.00	\$107.05		487.69
August.....		100.02	150.00	14.87		271.97
September.....		351.73	150.00	21.95		502.88
October.....		91.19	150.00	.66		241.19
November.....		100.20	150.00			100.20
December.....						
Totals.....	\$3,500.00	\$1,440.72	\$1,015.00	\$144.52	\$381.65	\$3,481.89
1920						
December.....			\$18.11			\$18.11
Totals.....			\$18.11			\$18.11
Grand totals.....	\$3,500.00	\$1,440.72	\$1,033.11	\$144.52	\$381.65	\$3,500.00

REPORT OF STATE ENGINEER

Segregated Expenditures from Appropriations for Support of Cooperative Snow Survey

Month	Appropriated by Legislature	Traveling expense	Salaries	General expense	Stationery	Equipment	Totals
1919							
January	\$1,500.00						
February							
March							
April							
May							\$90.62
June		\$39.70	\$43.00	\$28.98	\$7.51	22.15	141.29
July							
August							
September							
October		13.00	12.00	3.45	5.29		33.74
November		94.51	45.00	57.95	.96	86.21	284.62
December		21.53	94.51	12.50	28.85		157.39
Totals	\$1,500.00	\$168.74	\$194.51	\$102.83	\$42.60	\$168.98	\$677.66
1920							
January			\$87.00	\$2.30	\$4.75		\$94.05
February		\$2.28	12.00	4.00	1.00		19.26
March		9.42	12.00	4.63	10.85		
April		47.04	221.00	3.57	2.50	\$186.48	459.59
May		12.00	33.00	11.11	5.85		61.96
June				15.76	6.30		22.06
July					10.25	21.06	31.33
August				.55	9.50	16.13	26.18
September							
October				41.03	4.70		71.02
November			25.29				
December							
Totals		\$70.72	\$390.29	\$82.94	\$55.70	\$222.69	\$822.34
Grand totals	\$1,500.00	\$239.46	\$684.80	\$185.77	\$98.30	\$391.67	\$1,500.00

TABLE OF ABBREVIATIONS

App.	Application	Den.	Denied	P. B. U.	Proof of beneficial use filed
ac. ft.	acre-feet	Dom. or Domes.	Domestic	Res.	Reservoir
Can.	Canceled	Fk.	Fork	S. W. E. N.	South, West, East, North
Can.	Canyon (when used under name of source)	inc.	including	Spr. or Spg.	Spring
Cert.	Certificate	Irrig.	Irrigation	Spr.	Spring
c.f.s.	cubic feet per second	L. & S. Co.	Land & Stock Co.	Transp.	Transportation
chg. pt. div.; chg. div.	change point of diversion	Manfg.	Manufacturing	Trib.	Tributary
Cr., Crk., or Ck.	Creek	Mill.	Milling	Trib.	Tributaries
Crs.	Creeks	Min.	Mining	Wdn.	Withdrawn

**STATUS OF APPLICATIONS TO APPROPRIATE WATER FILED IN THE OFFICE OF STATE ENGINEER
DURING THE YEARS 1919-1920**

Serial No.	Date of filing	Applicant	Source	Purpose, including domestic	Action on application	Amount allowed	Action on permit
5346	1 6 19	C. G. Van Ness	Cave Spring	Stock	App 5 27 20	0.12 c.f.s.	
5347	1 6 19	C. G. Van Ness	Valcaldio Spring	Stock	App 7 2 19	0.1 c.f.s.	P.B.U.
5348	1 6 19	Geo. W. Friedhoff	East Walker River	Irrigation	App 12 23 19	0.4 c.f.s.	
5349	1 7 19	Clifford J. Fairchild	Truckee River	Irrigation	App 12 23 19	0.4 c.f.s.	
5350	1 9 19	Frank J. Inman	Seepage and undg. waters	Irrigation	App 4 25 19	1 c.f.s.	
5351	1 9 19	Frank J. Inman	Seepage and undg. waters	Irrigation	App 12 1 20	3.2 c.f.s.	
5352	1 13 19	James L. Richards	Unknown springs	Irrigation	App 6 14 19	0.6 c.f.s.	
5353	1 14 19	Wm. DeLong	Deer Creek	Irrigation	App 8 6 19	2.49 c.f.s.	
5354	1 14 19	James Dyrart	Schell Canon Creek	Irrigation	App 8 19 19	0.025 c.f.s.	P.B.U.
5355	1 16 19	Robert B. Stewart	Pumpnickel Springs	Stock			
5356	1 16 19	R. F. Goodman	Bullfrog Spring	Irrigation			
5357	1 16 19	Union Land & Cattle Co.	Jack Creek	Irrigation			
5358	1 17 19	C. G. Van Ness	Unnamed spring	Stock			
5359	1 17 19	C. G. Van Ness	Coyote Hole Spring	Stock			
5360	1 17 19	C. G. Van Ness	North Spring	Stock			
5361	1 17 19	C. G. Van Ness	Mud Spring	Stock			
5362	1 17 19	Roger D. Dougherty, et al.	Willow Creek	Irrigation	App 2 25 20	8.4 c.f.s.	
5363	1 20 19	Chas A. Hendel	West Walker River	Irrigation	App 5 4 20	0.025 c.f.s.	
5364	1 20 19	John B. Yount	Well	Irrigation	App 12 2 19	5.6 c.f.s.	
5365	1 20 19	L. R. Arnold, et al.	Virgin River	Irrigation			
5366	1 22 19	Walter L. Bell	Bodie Creek	Irrigation			
5367	1 22 19	Imogene D. Bell	Sheep Can. Sprs. and Tribs.	Irrigation	App 10 23 19	0.025 c.f.s.	
5368	1 23 19	Albert Oxtoly	Unknown spring	Irrigation	App 12 23 19	0.3 c.f.s.	Can
5369	1 23 19	Chas. H. Taylor	Rim Rock Spring	Stock			
5370	1 24 19	Frank A. Thorley	Black Canyon flood water	Stock	App 8 25 19	10 acre-feet	
5371	1 25 19	Frank A. Thorley	Upper Dry Lake flood water	Stock	App 8 25 19	25 acre-feet	
5372	1 25 19	C. C. Todd, Trustee	East Walker River	Irrigation	Can 3 26 19		
5373	1 25 19	C. C. Todd, Trustee	West Carson River	Irrigation			
5374	1 28 19	H. W. Settlemeyer	Warm Spring	Power	App 1 7 20	0.025 c.f.s.	
5375	1 29 19	Alma Woods	Daisy Creek Sprs. and Tribs.	Stock	App 4 9 19	6.4 c.f.s.	
5376	1 31 19	Samuel R. & Harry L. Clark	Powell Spring No. 1	Irrigation	App 12 30 19	0.025 c.f.s.	
5377	2 1 19	H. F. Powell	Powell Spring No. 2	Stock	App 12 30 19	0.025 c.f.s.	
5378	2 1 19	H. F. Powell	Lamolle Creek	Irrigation			
5379	2 1 19	Gust. G. Rahas	Rogers Spring	Irrigation			
5380	2 6 19	Nevada Fire Ins. Co.	Unnamed creek	Irrigation			
5381	2 6 19	A. E. Kane	Unnamed creek	Mining	Can 6 24 19		
5382	2 6 19	A. E. Kane	Spring Willow Canyon	Mining	Can 6 24 19		
5383	2 8 19	Nevada Packard Mines Co.	Carey Canyon & Big Spring	Mining	App 6 20 19	0.25 c.f.s.	
5384	2 8 19	E. C. Murphy, et al.	Gold Hill Springs	Irrigation	App 3 15 20	9.6 c.f.s.	
5385	2 10 19	John P. Buzanes	Gold Hill Springs	Stock	App 6 4 20	0.025 c.f.s.	
5386	2 11 19	John G. Taylor, et al.	Humboldt River	Irrigation			
5387	2 11 19	John Vossel	Low Creek	Irrigation	App 11 17 20	1.8 c.f.s.	
5388	2 13 19	J. H. Clemens	Marys River	Irrigation			

5389	2 13 19	John Labat	Fondaway Canon Spring	Stock	App 10 28 19	0.025 c.f.s.	Can
5390	2 14 19	Edward McGhee	S. Fk. Thousand Creek	Irrigation	App 3 9 20	1 c.f.s.	Can
5391	2 15 19	Union Land & Cattle Co.	Cottonwood Creek	Irrigation			
5392	2 17 19	J. L. & H. L. Sharp	Sheep Mtn. Reservoir No. 2	Stock	App 8 19 19	0.025 c.f.s.	Can
5393	2 17 19	J. L. & H. L. Sharp	Sheep Mtn. Reservoir No. 1	Stock	App 8 19 19	0.025 c.f.s.	Can
5394	2 19 19	Godward Bros.	Seepage water	Irrigation	App 12 17 19	0.4 c.f.s.	
5395	2 20 19	Ed. W. Clark	Duck Creek and Tributaries	Irrigation	App 10 28 19	3.2 c.f.s.	
5396	2 21 19	I. G. M. Southey	Pillar Springs	Stock	App 12 8 19	0.025 c.f.s.	
5397	2 24 19	Chas. Frisbee	Rose Creek	Irrigation	App 12 2 19	0.5 c.f.s.	
5398	2 24 19	Utah Construction Co.	Six Mile Creek	Irrigation	App 6 2 19	15 c.f.s.	Can
5399	2 24 19	Utah Construction Co.	Snauc Creek	Irrigation	App 9 23 19	1 c.f.s.	
5400	2 24 19	Albert G. Brown	Brown's Creek	Irrigation	Can 5 24 19		
5401	2 26 19	C. L. Wadsworth & Bros.	Bluff Springs	Stock			
5402	3 3 19	John Wm. Buckley	Cherry Pine, Cottonwood Cr.	Irrigation			
5403	3 5 19	Gabriel Rossi	Rabbit Creek	Irrigation			
5404	3 6 19	Henry C. Schmidt, et al.	Colorado River	Power	App 10 11 20	Sufficient for 1,000 hp.	
5405	3 10 19	Clark Huff, et al.	Silver Park Spring	Stock	Den 11 14 19		
5406	3 10 19	Pete Salicchi	Lamoille Creek	Irrigation	Den 7 1 20		
5407	3 10 19	Wm. H. Kershaw	Warm Creek	Irrigation			
5408	3 10 19	Wm. H. Kershaw	Snow Water Lake	Irrigation			
5409	3 10 19	Ripley and Glafcke	Shoddy Creek	Irrigation	Can 5 24 19		
5410	3 10 19	Ripley and Glafcke	Weeks Creek	Irrigation	Can 5 24 19		
5411	3 10 19	Ripley and Glafcke	Wiseman Creek	Irrigation	Can 5 24 19		
5412	3 10 19	Ripley and Glafcke	Warm Springs	Irrigation			
5413	3 10 19	Ripley and Glafcke	Warm Creek	Power	Can 5 24 19		
5414	3 11 19	Ripley and Glafcke	Warm Creek	Irrigation	Can 5 24 19		
5415	3 11 19	H. H. Springmeyer	Carson River	Irrigation			
5416	3 12 19	Land Dev. & L. S. Co.	Peavine Creek	Irrigation	Can 5 24 19		
5417	3 12 19	San Antonio Ranch & Cattle Co.	Peavine Canon	Irrigation			
5418	3 13 19	Julius H. Chatelle	Nye Creek	Irrigation			
5419	3 13 19	McGowan & Wilson	Wilson Spring	Irrigation	App 11 19 19	0.8 c.f.s.	
5420	3 15 19	Vineyard Land & Stock Co.	Nine Mile Creek	Stock	App 6 2 19	0.025 c.f.s.	
5421	3 15 19	Utah Construction Co.	Unnamed spring	Stock	App 6 2 19	0.025 c.f.s.	
5422	3 15 19	Utah Construction Co.	Unnamed spring	Stock	App 6 2 19	0.025 c.f.s.	
5423	3 15 19	Vineyard Land & Stock Co.	Unnamed spring	Stock	App 10 28 20	0.012 c.f.s.	
5424	3 15 19	Plymouth Land & Stock Co.	West Walker River	Irrigation			
5425	3 15 19	F. B. Stewart	Martin Creek	Irrigation			
5426	3 17 19	John C. Drege	Meadow Valley Wash	Irrigation	App 10 24 19	3.2 c.f.s.	Can
5427	3 17 19	John F. Lewis	Vineyard Valley Wash	Irrigation	App 10 29 19	2.4 c.f.s.	Can
5428	3 19 19	Nevada Hydraulic Gold Mining Co.	Walker River	Irrigation	Can 5 24 19		
5429	3 19 19	Antelope Valley Land & Cattle Co.	Walker River	Mining	App 11 6 19		
5430	3 20 19	Preston Irrigation Co.	Jakes Valley Wash	Irrigation			
5431	3 20 19	Chas. E. Kent	Black Jack Wash	Irrigation			
5432	3 21 19	John Cazier & Sons Co.	Ripley Spring	Stock	App 10 28 19	0.025 c.f.s.	
5433	3 25 19	Glover Valley L. & S. Co.	Trout Creek	Power	App 10 29 19	20 c.f.s.	
5434	3 27 19	Glover Valley L. & S. Co.	Evans or Spring Cr. and Trib.	Irrigation	App 6 6 19	Chg. div.	
5435	3 27 19	Wm. States	Evans or Spring Cr. and Trib.	Irrigation	App 6 6 19	Chg. div.	
5436	3 29 19	Benoit Lohidoy, et al.	Underground water	Irrigation	App 3 18 20	5 c.f.s.	
5437	4 1 19	James Dahl	N. Fork Cottonwood Creek	Stock			
5438	4 1 19	Joe Currey	Willow Creek	Mining	App 3 12 20	3 c.f.s.	
5439	4 2 19	Walker River Irrigation District	South Fork Owyhee River	Irrigation			
5440	4 3 19		East Walker River	Irrigation			

APPLICATIONS TO APPROPRIATE WATER—Continued

Serial No.	Date of filing	Applicant	Source	Purpose, including domestic	Action on application	Amount allowed	Action on permit
5441	4 4 19	Henry Helbig	Rock Creek	Irrigation	App 11 18 20	1.6 c.f.s.	-----
5442	4 7 19	A. G. Birch	Kleckner Creek	Power	-----	-----	-----
5443	4 7 19	A. G. Birch	Creek No. 3	Power	-----	-----	-----
5444	4 7 19	A. G. Birch	Furlong Creek	Power	-----	-----	-----
5445	4 7 19	A. G. Birch	Creek No. 2	Power	-----	-----	-----
5446	4 7 19	Philip Steinman	Artesian well	Irrigation	App 3 18 20	1 c.f.s.	-----
5447	4 8 19	Eli Cann	Bir Ball Mare Ck. and others	Irrigation	App 12 2 19	0.8 c.f.s.	-----
5448	4 9 19	Thomas J. Mansfield	Dixie Valley Str. and Trlb.	Irrigation	App 12 2 19	3.2 c.f.s.	-----
5449	4 9 19	Thomas J. Mansfield	Hardin's Creek	Irrigation	-----	-----	-----
5450	4 9 19	D. B. Bailey	McNeill Spring	Stock	Can 10 6 19	-----	-----
5451	4 12 19	Sylvain Siard	Unnamed spring	Stock	App 11 24 19	0.025 c.f.s.	-----
5452	4 12 19	Sylvain Siard	Dutch Johns Spgs. and Crk.	Irrigation	App 11 24 19	0.4 c.f.s.	-----
5453	4 14 19	August Siard	Unnamed springs	Irrigation	App 12 23 19	1.0773 c.f.s.	-----
5454	4 16 19	Geo. E. McKenna	Lone Mountain Springs	Stock	Wdn 5 27 19	-----	-----
5455	4 17 19	E. H. Sweetland et al.	East Walker River	Irrigation	-----	-----	-----
5456	4 17 19	Abner A. Travis, et al.	East Walker River	Irrigation	-----	-----	-----
5457	4 17 19	John White	Unnamed stream	Irrigation	-----	-----	-----
5458	4 17 19	Sam C. Wamboldt	Bir Spring	Irrigation	App 12 30 19	2.8 c.f.s.	-----
5459	4 17 19	C. I. Wedsworth & Bros.	Parumple Spring	Stock	App 10 20 19	3.2 c.f.s.	-----
5460	4 18 19	Morton W. Isaac	Crooked Canyon Creek	Irrigation	Can 10 6 19	-----	-----
5461	4 25 19	Hector Bunker	Meadow Valley Wash	Irrigation	App 12 17 19	1.6 c.f.s.	-----
5462	4 26 19	John C. Wholey	Bir Creek	Irrigation	App 10 25 19	3.2 c.f.s.	-----
5463	4 26 19	Byron S. Howard	Granite Creek	Irrigation	-----	-----	-----
5464	4 26 19	H. E. Schell	Chicken Ranch Spring	Irrigation	App 6 6 20	0.4 c.f.s.	-----
5465	4 26 19	Grover C. Shank	Trout Creek	Irrigation	-----	-----	-----
5466	4 28 19	Geo. Hatch & Nick Howe	Peavine Creek	Irrigation	-----	-----	-----
5467	4 28 19	Miguel Zubiri	Side Hill Spring	Stock	Den 12 11 19	-----	-----
5468	4 28 19	Miguel Zubiri	Cottonwood Spring	Stock	Den 12 11 19	-----	-----
5469	4 28 19	Miguel Zubiri	Dolan's Trap Spring	Stock	Den 12 11 19	-----	-----
5470	4 28 19	Miguel Zubiri	Lower Spring	Stock	Den 12 11 19	-----	-----
5471	4 28 19	Miguel Zubiri	Cherry Spring	Stock	Den 12 11 19	-----	-----
5472	4 28 19	Miguel Zubiri	Upper Long Gulch Spring	Stock	Den 12 11 19	-----	-----
5473	4 28 19	Miguel Zubiri	Upper Spring Gulch Springs	Stock	Den 12 11 19	-----	-----
5474	4 28 19	Miguel Zubiri	Skull Spring	Stock	Den 12 11 19	-----	-----
5475	4 30 19	Silverfield Alax Mines Co.	Upper Bellehelen Creek	Mining	Can 10 6 19	-----	-----
5476	4 30 19	Bellehelen Sunrise Mining Co.	Upper Bellehelen Creek	Mining	Can 10 6 19	-----	-----
5477	5 1 19	John G. Taylor	Antelope Canon Creek	Irrigation	-----	-----	-----
5478	5 1 19	L. Zubiri	Eldorado Canyon Creek	Irrigation	-----	-----	-----
5479	5 1 19	John G. Taylor	Indian Spring	Irrigation	-----	-----	-----
5480	5 2 19	Guy Von Staden	Unnamed spring	Irrigation	App 1 6 20	0.03 c.f.s.	-----
5481	5 2 19	H. A. Hoffman	Rock Spring	Stock	Can 10 6 19	-----	-----
5482	5 3 19	P. Frenzi Estate	Cherry Crk. and Frenzi Spr.	Irrigation	Den 12 11 19	-----	-----
5483	5 3 19	Manuel Antonio	McCann Creek	Irrigation	-----	-----	-----
5484	5 3 19	John G. Taylor	Rocky Canyon Creek	Irrigation	-----	-----	-----
5485	5 6 19	Smith and McKnight	Minnehaha Creek	Irrigation	Can 10 6 19	-----	-----

5487	Adams McGill Co.	White River Slough	Irrigation	Wdn 7 26 19		
5488	John Big Six Mining Co.	Rocky Canon Creek	Mining			
5489	Geo. M. Pencil	Penland Spring	Irrigation	App 10 25 19	0.5 c.f.a.	
5490	True Vencil	Old River	Irrigation			
5491	R. I. Douglas	Old River	Irrigation			
5492	E. B. Williams	Unnamed creek	Irrigation	Den 12 23 19		
5493	Ledie Stewart	Virgin River	Irrigation	App 10 29 19	3.2 c.f.a.	
5494	Ira B. Whitner	Seven Hill Springs	Stock	App 2 26 20	0.025 c.f.a.	
5495	Geo. H. C. Belcher	Old River	Irrigation			
5496	Clayton C. Whaley	Wagon Creek	Irrigation			
5497	John C. Whaley	Jack Spring & Trib.	Irrigation	App 8 27 20	5 c.f.a.	
5498	Geo. Doyle, et al.	Little Spring	Mining	App 3 12 20	0.4 c.f.a.	
5499	Edith Morgan	Indian Springs	Irrigation	App 3 23 20	0.025 c.f.a.	
5500	D. C. McCafferty	Old River	Stock			
5501	Chas. E. Kent	Kent's Well	Irrigation			
5502	E. J. Hart & S. T. Bentley	Silver Bee Creek	Stock	App 10 28 19	0.025 c.f.a.	
5503	Chas. E. Kent	Unnamed spring	Irrigation	App 12 8 19	0.075 c.f.a.	
5504	Chas. J. C. Geyman	Dutch Bill Lake	Irrigation			
5505	Chas. E. Kent	Steamboat Creek	Irrigation			
5506	P. Y. Gillson	Cox Canyon Springs	Stock	App 12 3 19	0.025 c.f.a.	
5507	John W. Freeman Co.	Old River	Stock			
5508	W. H. Williams, et al.	Little Spring	Stock			
5509	W. H. Williams, et al.	Manneth Spring	Stock			
5510	W. H. Williams, et al.	Upper Tiger Canon Springs	Stock			
5511	W. H. Williams, et al.	Upper Tiger Canon Springs	Stock			
5512	W. H. Williams, et al.	Upper Tiger Canon Springs	Stock			
5513	W. H. Williams, et al.	Upper Tiger Canon Springs	Stock			
5514	Frank A. Cluff	Upper Tiger Canon Springs	Stock			
5515	Philip W. Baker	Upper Tiger Canon Springs	Stock			
5516	T. H. Dor, et al.	Upper Tiger Canon Springs	Stock			
5517	Graver M. D., et al.	Upper Tiger Canon Springs	Stock			
5518	C. E. McCafferty	Upper Tiger Canon Springs	Stock			
5519	Smith and McKnight	Upper Tiger Canon Springs	Stock			
5520	W. M. Harwood	Upper Tiger Canon Springs	Stock			
5521	Guy Van Staden	Upper Tiger Canon Springs	Stock			
5522	Earl Heath	Upper Tiger Canon Springs	Stock			
5523	Clifton Dunlap	Upper Tiger Canon Springs	Stock			
5524	Mohai Bland	Upper Tiger Canon Springs	Stock			
5525	Hyde W. Wilcox	Upper Tiger Canon Springs	Stock			
5526	R. L. Douglas	Upper Tiger Canon Springs	Stock			
5527	Walker River Irrigation District	Upper Tiger Canon Springs	Stock			
5528	Odillo O. Tornini	Upper Tiger Canon Springs	Stock			
5529	Odillo O. Tornini	Upper Tiger Canon Springs	Stock			
5530	Odillo O. Tornini	Upper Tiger Canon Springs	Stock			
5531	Christian H. Pederson	Upper Tiger Canon Springs	Stock			
5532	Chas. A. Handel	Upper Tiger Canon Springs	Stock			
5533	The San Antonio Ranch & Cattle Co.	Upper Tiger Canon Springs	Stock			
5534	Schreck Bros.	Upper Tiger Canon Springs	Stock			
5535	Kate Martinez	Upper Tiger Canon Springs	Stock			
5536	United States of America Indian Service	Upper Tiger Canon Springs	Stock			
5537	United States of America Indian Service	Upper Tiger Canon Springs	Stock			

APPLICATIONS TO APPROPRIATE WATER—Continued

Serial No.	Date of filing	Applicant	Source	Purpose, including domestic	Action on application	Amount allowed	Action on permit
5538	6 12 19	Copper Canyon Mining Co.	Magnolia Springs	Mining	App 10 28 20	1 c.f.s.	
5539	6 14 19	Griswold-Henderson Livestock Co.	Hot Springs	Irrigation			
5540	6 14 19	Chatom and Vignolo	Tula George Spring	Stock			
5541	6 16 19	Nevada Hydraulic Gold Mining Co.	Upper Cottonwood Spring	Mining	App 11 24 19	0.4 c.f.s.	
5542	6 16 19	Sylvain Siard	Lower Cottonwood Spring	Irrigation	App 11 24 19	0.4 c.f.s.	
5543	6 16 19	David Darwin Cluff	Deep Creek	Irrigation			
5544	6 17 19	F. L. Lathrop	Bell Spring	Irrigation	App 2 2 20	0.6 c.f.s.	
5545	6 18 19	John Papesh	Woodman Springs	Irrigation	App 8 25 20	0.025 c.f.s.	
5546	6 18 19	J. W. Simkins, et al.	Kate Spring	Stock	App 8 25 20	0.025 c.f.s.	
5547	6 18 19	J. W. Simkins, et al.	Betsy Spring	Stock	App 8 25 20	0.025 c.f.s.	
5548	6 18 19	J. W. Simkins, et al.	Reuben Coal Spring	Stock	Can 10 6 19	0.025 c.f.s.	
5549	6 18 19	J. W. Simkins, et al.	Cedar Springs	Mining	App 7 2 20	0.0125 c.f.s.	
5550	6 20 19	A. A. Smith, et al.	Cottonwood Spring	Stock			
5551	6 20 19	Fred Henroid	Crescent Spring	Stock	App 3 12 20	0.8 c.f.s.	
5552	6 21 19	C. I. Wadsworth, et al.	Bateman's Spring	Irrigation	App 2 26 20	0.2 c.f.s.	
5553	6 21 19	Donnelly L. & L. S. Co.	Happy Hollow Spring	Irrigation	App 2 26 20	0.2 c.f.s.	
5554	6 21 19	Amy Devlin	Hillcrest Spring	Irrigation	Can 10 6 19	0.2 c.f.s.	
5555	6 21 19	Laura Stephan	Sulphur Spring No. 2	Stock	Can 10 6 19		
5556	6 23 19	J. H. Robison & Sons	Cottonwood Creek	Stock	Can 10 6 19		
5557	6 23 19	J. H. Robison & Sons	Sulphur Spring No. 1	Stock	Can 10 6 19		
5558	6 23 19	J. H. Robison & Sons	Mud Spring	Stock			
5559	6 23 19	J. H. Robison & Sons	Trough Spring	Irrigation	Wdn 12 8 20		
5560	6 23 19	Pahrump Valley Co.	Buck Spring	Irrigation	App 6 6 20	0.0125 c.f.s.	
5561	6 23 19	J. W. Henrich	Malloy Spring	Stock	App 6 6 20	0.0125 c.f.s.	
5562	6 23 19	E. A. Henrich, et al.	Lows Canon	Stock	App 6 6 20	0.0125 c.f.s.	
5563	6 23 19	Pete Marluch	Rock Spring	Stock	Wdn 4 24 20		
5564	6 23 19	Pete Marluch	Summit Spring	Irrigation	Den 7 1 20		
5565	6 23 19	Mat Kogan	Unnamed spring	Stock	App 8 27 20	0.025 c.f.s.	
5566	6 23 19	Angus B. McDonald	Unnamed spring	Stock	App 8 27 20	0.025 c.f.s.	
5567	6 23 19	Angus B. McDonald	Unnamed spring	Stock	App 8 27 20	0.025 c.f.s.	
5568	6 23 19	Angus B. McDonald	Cottonwood Spring	Stock	App 8 27 20	0.025 c.f.s.	
5569	6 23 19	Angus B. McDonald	Sharpe Creek	Stock			
5570	6 23 19	Andrew Boundy	Middle Creek	Stock	App 3 10 20	1 c.f.s.	
5571	6 23 19	Andrew Boundy	Underground water	Stock	Den 5 4 20		
5572	6 23 19	H. W. Bruner	Silver Park Spring	Stock			
5573	6 23 19	Clark Hult & H. Gunderson	Unnamed spring	Mining	Can 9 5 19		
5574	6 24 19	William T. O'Neill	Mariposa Creek	Irrigation	Wdn 10 27 19		
5575	6 25 19	Mrs. Nellie Prosser	Unnamed spring	Stock			
5576	6 25 19	Adam E. Reinhart, et al.	Wardell Spring	Stock			
5577	6 25 19	Harley Delvin, et al.	Trough Spring	Stock	Wdn 8 18 19		
5578	6 25 19	Wm. V. Odgers	Unnamed spring	Stock			
5579	6 26 19	Wm. V. Odgers	Trough Spring	Stock			
5580	6 26 19	Wm. V. Odgers	Water Canyon	Irrigation	App 4 9 20	Chr. div.	
5581	6 26 19	Nick Ratto					
5582	6 27 19						

5583	6 28 19	H. R. Lemaire	Long Creek and Spring	Mining	App 3 27 20	0.5 c.f.a.	
5584	6 28 19	Silver Peak Chemical Co.	Unnamed spring	Mining	App 3 27 20	0.5 c.f.a.	
5585	6 28 19	Silver Peak Chemical Co.	Minnesota Spring No. 1	Mining	App 3 27 20	0.5 c.f.a.	
5586	6 28 19	Silver Peak Chemical Co.	Minnesota Spring No. 2	Mining	App 3 27 20	0.5 c.f.a.	
5587	6 28 19	Silver Peak Chemical Co.	Minnesota Spring No. 3	Mining	App 3 27 20	0.5 c.f.a.	
5588	6 28 19	Silver Peak Chemical Co.	Minnesota Spring No. 4	Mining	App 3 27 20	0.5 c.f.a.	
5589	6 28 19	John O'Kennedy	Chiatovich Creek	Mining	App 3 27 20	0.5 c.f.a.	
5590	6 30 19	Thos. Mathis	Unnamed spring	Irrigation			
5591	7 2 19	C. R. Wedertz	Desert Creek	Irrigation	Can 10 3 19		
5592	7 3 19	W. A. Marsh	Combination Springs	Stock			
5593	7 3 19	Harry N. Williams, et al.	Colorado River	Power	Can 10 6 19		
5594	7 7 19	Smith and McKnight	Minnehaha Creek	Irrigation	App 3 10 20	0.025 c.f.a.	Can
5595	7 7 19	Cliff Dunlap	Pine Creek Spring	Stock	App 3 18 20	0.25 c.f.a.	
5596	7 8 19	Michael Knopf	Cottonwood Creek	Irrigation			
5597	7 8 19	J. H. Goodman	Unnamed spring	Irrigation	Can 10 6 19		
5598	7 8 19	H. L. Anderson	Cold Spring	Irrigation	Can 10 6 19		
5599	7 8 19	H. L. Anderson	Quakemasp Spring	Irrigation	Can 10 6 19		
5600	7 8 19	H. L. Anderson	Crystal Springs	Irrigation	Can 10 6 19		
5601	7 8 19	J. H. Goodman	Willow Springs	Stock	App 11 17 20	0.0125 c.f.a.	
5602	7 10 19	Pete Mariluch	Jones Spring	Stock	App 3 16 20	0.1 c.f.a.	
5603	7 10 19	J. J. Hellum	Shady Run Canyon Springs	Irrigation			
5604	7 10 19	H. B. Bolton	Bee Canyon	Irrigation			
5605	7 11 19	R. A. Kinne	Emeralda Gulch	Mining			
5606	7 12 19	Patrick Toner	Unnamed spring	Irrigation	App 11 17 20	1.2 c.f.a.	
5607	7 12 19	J. Fred Vogel	Donnelly Creek	Irrigation			
5608	7 14 19	Frank A. Schmidt	Cottonwood Creek	Irrigation	App 3 23 20	1.6 c.f.a.	
5609	7 14 19	Elmer J. Isaac	Sheep Corral Can. Springs	Irrigation	App 12 1 20	0.25 c.f.a.	
5610	7 14 19	Alexandro Duferrera	Cowden Creek	Irrigation	Can 10 6 19		
5611	7 14 19	Mike Sala	Mill Spring	Stock			
5612	7 15 19	Cooper & Unjacke, et al.	Pleasant Valley Creek	Irrigation			
5613	7 15 19	J. N. Phillips	Ford Spring	Stock			
5614	7 15 19	Wm. B. Parsons	Wilson Creek	Irrigation			
5615	7 16 19	A. Muss & Sons	Old River	Irrigation			
5616	7 16 19	E. B. Hoover	Old River	Irrigation			
5617	7 16 19	C. M. Cornell	Old River	Irrigation			
5618	7 17 19	Simon and Baker	Telephone Canyon Springs	Domestic	Can 10 6 19		
5619	7 17 19	P. H. Devlin	Rosebud Spring	Stock	App 3 23 20	0.025 c.f.a.	
5620	7 17 19	P. H. Devlin	Squaw Bush	Stock	App 3 23 20	0.025 c.f.a.	
5621	7 17 19	Andy Devlin	Cedar Spring	Stock	App 3 23 20	0.025 c.f.a.	
5622	7 17 19	Juan Yruzoque	Choke Cherry Spring	Stock			
5623	7 18 19	Chas. E. Kent	Stillwater Slough	Irrigation	Can 10 6 19		
5624	7 18 19	Sylvan Stard	Spring Creek	Irrigation	App 3 23 20	0.02 c.f.a.	
5625	7 21 19	H. A. Holmberg	Petersons Springs	Irrigation			
5626	7 21 19	Wm. I. Pledger	Seepage	Irrigation			
5627	7 21 19	J. A. Miller	Mountain Creek	Irrigation	App 11 23 19	4 c.f.a.	
5628	7 21 19	S. S. Arentz	Burbank Canyon	Irrigation			
5629	7 21 19	Ecolina Dotta	Unnamed springs	Irrigation			
5630	7 21 19	Ecolina Dotta	Unnamed springs	Irrigation			
5631	7 21 19	David C. Empey	Winze Creek	Irrigation			
5632	7 21 19	Helga R. Snyder	Penrod Creek	Irrigation			
5633	7 22 19	John F. Wilson	Cold Kiln Springs	Irrigation			
5634	7 23 19	Lynn Big Six Mining Co.	Unnamed spring	Stock	Can 10 6 19		
5634	7 23 19			Mining			

APPLICATIONS TO APPROPRIATE WATER—Continued

Serial No.	Date of filing	Applicant	Source	Purpose, including domestic	Action on application	Amount allowed	Action on permit
5535	7 24 19	Joseph Giraud	Mt. Hicks Runoff	Stock			
5536	7 24 19	R. A. Kinne	Underground water	Irrigation			
5537	7 25 19	Gen. N. Dieringer	Dodge Spring	Stock	App 6 7 20	0.01 c.f.a.	
5538	7 28 19	Mike Cooper	Bob Reid Canon	Irrigation			
5539	7 28 19	Mike Magnuson, et al.	Stagtoe Cañon	Irrigation			
5540	7 28 19	Mike Salomon	Black Rock Spring	Stock			
5541	7 28 19	C. E. Anderson	First Creek	Irrigation			
5542	7 28 19	Facile Live Stock Co.	Alder Creek	Irrigation	App 11 17 20	1.620 acre-feet	P.B.U.
5543	7 29 19	C. I. Ryan	Boulder Spring	Stock	App 3 16 20	0.025 c.f.a.	
5544	7 31 19	Ed Gallagher, et al.	Lodi Springs	Mining	App 6 7 20	0.05 c.f.a.	
5545	7 31 19	W. H. Pitts, et al.	Mud Lake	Stock	App 12 30 19	40 acre-feet	
5546	8 1 19	R. A. Kinne	Quartz Spring	Stock	App 10 5 20	0.015 c.f.a.	
5547	8 2 19	R. A. Kinne	No. 1 Gulch Spring	Mining			
5548	8 2 19	R. A. Kinne	Brennan Gulch	Mining			
5549	8 2 19	R. A. Kinne	Underground water	Mining			
5550	8 2 19	N. C. Johnson, et al.	Big Spring	Irrigation			
5551	8 2 19	N. C. Johnson, et al.	Unnamed spring	Irrigation			
5552	8 4 19	Milo A. Cain	Perote Springs	Stock			
5553	8 4 19	W. N. Pettit	Spring Branch Creek	Irrigation			
5554	8 4 19	The Blaine Gold Mining and Milling Co.	Water Canon Springs	Mining			
5555	8 4 19	Nevada Buster Co.	Tiger Canon	Power			
5556	8 5 19	C. C. Luce	S. Fk. Owyhee River	Irrigation			
5557	8 5 19	Allice E. Luce	S. Fk. Owyhee River	Irrigation	App 11 17 20	0.02 c.f.a.	
5558	8 5 19	Wm. J. Gardner	Gardner Spring	Stock			
5559	8 8 19	Chas. Minioletti	Monte Cristo Springs	Irrigation			
5560	8 8 19	Dave and Hazel Willis	Peterson Springs	Irrigation			
5561	8 9 19	United Cattle & Packing Co.	Abel Spring	Stock	App 5 19 20	0.02 c.f.a.	P.B.U.
5562	8 9 19	United Cattle & Packing Co.	Summer Spring	Stock	App 5 19 20	0.02 c.f.a.	P.B.U.
5563	8 9 19	United Cattle & Packing Co.	Stormy Springs	Stock	App 5 19 20	0.02 c.f.a.	P.B.U.
5564	8 11 19	Wm. Culverwell	Meadow Valley Stream	Irrigation	App 3 25 20	1 c.f.a.	
5565	8 11 19	Frank M. Schmidt	Jones Spring	Irrigation			
5566	8 13 19	John F. Wamboldt	Edwards Spring	Irrigation			
5567	8 13 19	Piermont Mines Co.	Piermont Creek	Power	App 6 7 20	15 c.f.a.	
5568	8 13 19	D. E. Moore	Moore's Springs	Mining			
5569	8 14 19	Ken E. Keller	Shermantown Springs	Mining	App 1 6 20	2 c.f.a.	Can
5570	8 14 19	Tonopah Shawmuth Mines Co.	Pilot Peak Springs	Mining	Can 3 16 20		
5571	8 15 19	J. T. Clark	Unnamed spring	Irrigation			
5572	8 15 19	Mike Sals	Willow Spring	Stock	Den 6 7 20		
5573	8 15 19	Albin C. Kirkeby	Cottonwood Spring	Stock	Den 6 7 20		
5574	8 15 19	Wm. J. Odgers	Williams Creek	Irrigation	App 7 15 20	2 c.f.a.	
5575	8 15 19	Pete Ichna	Mud Springs	Stock	App 3 10 20	0.025 c.f.a.	
5576	8 15 19	Fred W. Cook	Unnamed spring	Stock	Can 3 16 20		
5577	8 20 19	Ulan and Nevada Cattle Co.	Carson River	Irrigation			
5578	8 20 19	J. N. Smith	Tub Spring Basin	Stock	App 7 1 20	0.025 c.f.a.	
5579	8 20 19		Smith Spring	Stock	App 8 28 20	0.025 c.f.a.	

5680	J. L. & H. L. Sharp	Ash Spring Creek	Irrigation	App 11 17 20	0.02 c.f.s.	
5681	Wm. J. Gardner	Willow Springs	Stock	App 6 7 20	0.0015 c.f.s.	
5682	Chatum and Vignolo	Ben Grant Spring	Mining	App 3 15 20	2 c.f.s.	Can
5683	Rochester Combined Mines Co.	Black Knob Spring	Irrigation			
5684	Ethel S. Henrie	Lone Spring	Mining	Can 3 16 20		
5685	W. A. Smith	Unnamed spring	Mining	Can 3 16 20		
5686	W. A. Smith	Underground water	Mining			
5687	Brownie Mose	Sam Thompson Creek	Irrigation			
5688	John T. Reid	Carson Sink	Power			
5689	F. D. Brown	Tea Cup Spring	Mining	Can 3 16 20		
5690	J. W. Clarke	French Boy Canyon Spring	Irrigation	App 4 9 20	1 c.f.s.	
5691	Edwin E. Foster	Spring Valley Slough	Irrigation	App 6 7 20	2.8 c.f.s.	
5692	H. Leter	Old River	Irrigation			
5693	Frank J. Mathews	East Walker River	Irrigation	Can 3 16 20		
5694	F. B. Matson	Black Top Spring	Domestic			
5695	L. S. Weathers	Boulder Creek	Irrigation	Can 3 16 20		
5696	L. S. Weathers	Boulder Creek	Irrigation			
5697	John Peters, et al.	Gene Springs	Stock			
5698	Henry Bowling	Bucks Corral	Irrigation	App 3 10 20	1 c.f.s.	
5699	P. H. Devlin	Tank Spring	Stock	App 6 17 20	0.0125 c.f.s.	
5700	Nevada Birch Creek Mining Co.	Frying Pan Spring	Stock	App 3 29 20	0.025 c.f.s.	
5701	Mathew D. Rees	Steiner Canyon Creek	Mining	App 9 30 20	1 c.f.s.	
5702	P. Lambert & Co.	Meadow Valley Wash	Irrigation	App 6 8 20	0.025 c.f.s.	
5703	P. Lambert & Co.	Pot Spring	Stock	App 6 8 20	0.025 c.f.s.	
5704	P. Lambert & Co.	White Rock Spring	Stock	App 6 8 20	0.025 c.f.s.	
5705	P. Lambert & Co.	Willow Spring	Stock	App 6 8 20	0.025 c.f.s.	
5706	P. Lambert & Co.	Cave Creek Spring	Stock	App 6 8 20	0.025 c.f.s.	
5707	P. Lambert & Co.	Pony Spring	Stock	App 6 8 20	0.025 c.f.s.	
5708	P. Lambert & Co.	Butte Spring	Stock	App 6 8 20	0.025 c.f.s.	
5709	Western Pacific R. R. Co.	Unnamed spring	Transportation	Den 9 10 20	0.0125 c.f.s.	
5710	Geo. R. Gram, et al.	Rock Spring	Stock	App 8 28 20	0.6 c.f.s.	
5711	Geo. R. Gram, et al.	Arrow Mountain Drainage	Stock	App 3 10 20		
5712	R. A. Yelland	Mud Spring	Stock	Can 3 16 20		
5713	R. A. Yelland	Granite Spring	Stock	Can 3 16 20		
5714	R. A. Yelland	Snow Bank Spring	Stock	App 6 8 20	0.0125 c.f.s.	
5715	Nevada Highway Dep't.	Four Mile Spring	Stock	App 6 8 20	0.0125 c.f.s.	
5716	Oscar Gerbig	Garfield Springs	Public use	App 12 1 20	0.25 c.f.s.	
5717	Fritz Elges	Storm Canyon Spring	Stock	App 5 4 20	0.025 c.f.s.	
5718	Joe Yragui	Mahogany Springs	Stock	App 6 17 20	0.025 c.f.s.	
5719	Emery E. Garrett	Pine Creek	Irrigation			
5720	W. E. Beck	Gold Springs	Stock	App 5 24 20	0.025 c.f.s.	
5721	W. E. Beck	Big Timber Springs	Stock	App 5 24 20	0.025 c.f.s.	
5722	W. E. Beck	Rock Springs	Stock	App 5 24 20	0.025 c.f.s.	
5723	W. E. Beck	Bill Smith Springs	Stock	App 5 24 20	0.025 c.f.s.	
5724	Hans J. Lauritzen	Rock Springs	Irrigation	App 1 6 20	0.4 c.f.s.	
5725	Hans J. Lauritzen	Cherry Springs	Irrigation	App 1 6 20	0.4 c.f.s.	
5726	Obie Lefavor	Last Chance Creek	Irrigation	Wdn 11 23 20		
5727	Obie Lefavor	Ophir Creek	Irrigation	Wdn 11 23 20		
5728	Francis A. Swayne	Swayne Springs	Irrigation	App 5 4 20	1 c.f.s.	Can
5729	Herman J. Sadler	Unnamed springs	Irrigation	App 3 19 20	0.2 c.f.s.	Can
5730	Herman J. Sadler	Unnamed springs	Stock	App 3 19 20	0.025 c.f.s.	Can
5731	Herman J. Sadler	Unnamed springs	Stock	App 3 19 20	0.025 c.f.s.	Can

APPLICATIONS TO APPROPRIATE WATER—Continued

Serial No.	Date of filing	Applicant	Source	Purpose, including domestic	Action on application	Amount allowed	Action on permit
5732	9 11 19	Herman J. Sadler	Unnamed springs	Stock	App 3 19 20	0.025 c.f.s.	Can
5733	9 11 19	J. M. Simmons	Nigger Creek	Irrigation			
5734	9 12 19	Nat L. Hurd	Drain water	Irrigation	Can 3 16 20		
5735	9 12 19	Jean Cachenaat	Unnamed spring	Stock	App 11 29 19	0.5 c.f.s.	
5736	9 12 19	Fred Wallace	Cat Creek	Irrigation	App 3 29 20	0.125 c.f.s.	
5737	9 13 19	J. F. Dwyer	Unnamed spring	Mining			
5738	9 13 19	Pedro Corta	Williams Spring	Stock			
5739	9 13 19	Pedro Corta	Corta Well	Stock			
5740	9 13 19	Pedro Corta	Twin Springs	Stock			
5741	9 13 19	Pedro Corta	Boone Springs	Stock			
5742	9 16 19	Griswold Henderson Live Stock Co.	Lower Spruce Springs	Stock			
5743	9 16 19	Griswold Henderson Live Stock Co.	Upper Lathram Springs	Stock			
5744	9 16 19	Griswold Henderson Live Stock Co.	Lower Lathram Springs	Stock			
5745	9 16 19	Griswold Henderson Live Stock Co.	Upper Spruce Springs	Stock			
5746	9 18 19	John F. Wilson	Coal Kiln Springs	Stock	Can 3 16 20		
5747	9 19 19	G. N. Reid	School House Spring	Stock	App 6 8 20	0.0038 c.f.s.	
5748	9 19 19	W. S. Lamb	Deadman Spring	Stock	App 7 1 20	0.025 c.f.s.	
5749	9 19 19	T. J. Bell	Gouldy Well	Stock	App 12 9 20	0.0375 c.f.s.	
5750	9 19 19	Rita D. Miller	Indian Springs	Stock			
5751	9 20 19	Fahrump Valley Co.	Pinon Spring	Stock	App 12 10 20	0.0015 c.f.s.	
5752	9 20 19	Fahrump Valley Co.	Rosebud Spring	Stock	App 12 10 20	0.0015 c.f.s.	
5753	9 20 19	Fahrump Valley Co.	Buck Spring	Stock	App 12 10 20	0.0015 c.f.s.	
5754	9 22 19	Adams McGill Co.	Edwards Spring	Stock			
5755	9 22 19	Gregorio Urrutia Co.	Big Canyon Spring	Stock	App 6 25 20	0.016 c.f.s.	
5756	9 22 19	Gregorio Urrutia Co.	Urrutia Spring	Stock			
5757	9 22 19	Gregorio Urrutia Co.	Pine Spring	Stock			
5758	9 22 19	Gregorio Urrutia Co.	Crumb or Camel Spring	Stock			
5759	9 23 19	Mike Sals	Mill Spring	Stock	App 6 30 20	0.0125 c.f.s.	
5760	9 23 19	Alice S. MacFarland	Mesquite Springs	Irrigation	App 3 19 20	1 c.f.s.	
5761	9 23 19	Alice S. MacFarland	Well	Irrigation	App 3 19 20	1.6 c.f.s.	
5762	9 23 19	Alice S. MacFarland	Twin Springs	Irrigation	App 3 19 20	1 c.f.s.	
5763	9 24 19	Joyce Mining Co.	Scotts Springs	Mining			
5764	9 24 19	Angelo Cartago	Cherry Springs	Irrigation	App 6 18 20	0.4 c.f.s.	
5765	9 24 19	Angelo Cartago	Double Springs	Irrigation	App 6 18 20	0.4 c.f.s.	
5766	9 24 19	Dave Willis	Donkey Springs	Irrigation			
5767	9 24 19	Dave Willis	Pole Creek	Stock			
5768	9 25 19	L. E. McKenzie	Rock Spring	Irrigation	App 3 30 20	1 c.f.s.	
5769	9 26 19	John B. Sir,	West Walker River	Irrigation	App 9 10 20	0.4 c.f.s.	
5770	9 26 19	Louis Saroni	West Walker River	Irrigation			
5771	9 27 19	Richard M. Bell	Unnamed spring	Stock			
5772	9 27 19	Juan Yrasoqui	Blue Bell Spring	Stock			
5773	9 27 19	Juan Yrasoqui	Rock Spring	Stock			
5774	9 27 19	Juan Yrasoqui	Summit Spring	Stock			
5775	9 27 19	Juan Yrasoqui	Brisham Well Spring	Stock			
5776	9 27 19	Sharp Land & Cattle Co.	Clough Spring & Can.	Mining			
5776	9 29 19	Charleston Hill National Mines, Inc.	Clough Spring & Can.	Mining	App 3 15 20	1 c.f.s.	Can

5777	9 29 19	Ildore Laucier.	Domingo Springs.	Mining	Can	0.025 c.f.a.
5778	9 29 19	Samuel R. Clark, et al.	Unamed spring	Stock	App 6 17 20	0.0625 c.f.a.
5779	9 29 19	Samuel R. Clark, et al.	Unamed spring	Stock	App 6 19 20	0.0125 c.f.a.
5780	9 29 19	Samuel R. Clark, et al.	Unamed spring	Stock	App 6 19 20	0.01 c.f.a.
5781	9 29 19	Fritz Elges	Poco Spring	Stock	Can 3 16 20	0.8 c.f.a.
5782	9 29 19	James Ryan	Cottonwood Spring	Power	App 7 15 20	
5783	9 29 19	P. A. Simon	Cottonwood Spring	Irrigation		
5784	10 1 19	Minnie Cotant	East Walker River	Stock		
5785	10 1 19	Grant Welch	Dam Gulch Creek	Irrigation		
5786	10 1 19	Gregorio Urrutia Co.	Pine Creek	Stock		
5787	10 2 19	Gregorio Urrutia Co.	Rock Spring	Stock		
5788	10 2 19	P. P. Strasburg	Wall Spring	Irrigation	App 12 1 20	1.6 c.f.a.
5789	10 3 19	Fred Gansberg	Freeman Creek	Irrigation		
5790	10 3 19	S. C. Seymour	East Canyon River	Irrigation		
5791	10 4 19	A. W. Huston	Sheep Gulch	Mining		
5792	10 6 19	Winnemucca Water and Light Co.	Meadow Valley Stream	Irrigation		
5793	10 7 19	Silver Peak Chemical Co.	Water Canyon	Town supply		
5794	10 7 19	Silver Peak Chemical Co.	Upper Willow Spring	Mining	App 3 27 20	0.0625 c.f.a.
5795	10 7 19	William Curnow	Lower Willow Spring	Mining	App 3 27 20	0.0625 c.f.a.
5796	10 7 19	Josephine Laucier.	Unamed spring	Irrigation	App 3 15 20	1 c.f.a.
5797	10 7 19	Mrs. Milo A. Caine	Paradise Canyon Springs	Mining		
5798	10 8 19	Milo A. Caine	Caine Springs	Stock	App 5 4 20	0.025 c.f.a.
5799	10 8 19	P. A. Simon	Mud Springs	Power	App 5 4 20	0.025 c.f.a.
5800	10 8 19	Samuel R. Clark, et al.	East Walker River	Stock	Can 3 16 20	
5801	10 8 19	Samuel R. Clark, et al.	Elk Springs	Stock		
5802	10 8 19	Edward J. Deek	Deer Springs	Stock		
5803	10 8 19	James H. Wheeler	Pine Spring	Stock	App 6 28 20	0.003 c.f.a.
5804	10 8 19	Fritz Elges	Highland Spring No. 1	Irrigation	App 6 30 20	0.1 c.f.a.
5805	10 9 19	John B. Yount	Unamed spring	Stock		
5806	10 15 19	Carson River Mills Co.	Stump Springs	Stock	App 5 4 20	0.025 c.f.a.
5807	10 16 19	Wm. A. Moore	Carson River	Milling		
5808	10 17 19	W. A. Marsh	Bryascker Spring	Stock		
5809	10 18 19	Silver Peak Chemical Co.	Unamed spring	Stock		
5810	10 18 19	Silver Peak Chemical Co.	Unamed spring	Mining	App 3 27 20	0.0625 c.f.a.
5811	10 18 19	Frank V. Perry	Cottonwood Creek	Mining	App 4 2 20	1 c.f.a.
5812	10 18 19	Dan W. Devaney	Wall Canon Creek	Irrigation	App 3 29 20	1 c.f.a.
5813	10 18 19	Chas. F. Stanley	Ten Mile Spring	Stock	App 3 23 20	0.025 c.f.a.
5814	10 18 19	Pete Marluch	Lower Pueblo Springs	Stock	App 6 30 20	0.015 c.f.a.
5815	10 20 19	Adams-McGill Co.	Pete's Spring	Stock	App 5 17 20	0.0018 c.f.a.
5816	10 22 19	Adams-McGill Co.	Jamestown Spring	Stock	App 5 25 20	0.015 c.f.a.
5817	10 22 19	W. C. Pitt Co.	Akron Spring	Stock		
5818	10 23 19	W. C. Pitt Co.	Buffalo Springs	Stock	App 5 25 20	0.015 c.f.a.
5819	10 23 19	W. C. Pitt Co.	Troy Canyon	Stock		
5820	10 23 19	Blanche Siard	South Fork Fisher Canyon	Stock		
5821	10 23 19	Martin Ovarcabal, et al.	Coyotte Springs	Irrigation		
5822	10 24 19	Martin Ovarcabal, et al.	Pleasant Valley Creek	Irrigation	Wdn 8 9 20	
5823	10 24 19	Martin Ovarcabal, et al.	Big Creek	Irrigation		
5824	10 29 19	Martin Ovarcabal, et al.	Pole Creek	Irrigation		
5825	10 29 19	Martin Ovarcabal, et al.	Buckaroo Creek	Irrigation		
5826	10 29 19	Water Co. of Tonopah	Underground water	Mining	Can 3 16 20	
5827	10 30 19	Water Co. of Tonopah	Underground water	Mining		
5828	10 30 19	Water Co. of Tonopah	Underground water	Mining		

APPLICATIONS TO APPROPRIATE WATER—Continued

Serial No.	Date of filing	Applicant	Source	Purpose, including domestic	Action on application	Amount allowed	Action on permit
5829	11 1 19	John W. Tuck	Stanley B Spring	Mining	App 3 29 20	0.025 c.f.s.	
5830	11 1 19	Andy Devlin	Wardell Spring	Stock			
5831	11 1 19	J. R. Tognoni	Rock Bluff Springs	Irrigation	App 3 29 20	0.14 c.f.s.	
5832	11 3 19	Mrs. Hazel Van Norman	Kelly Springs	Irrigation			
5833	11 3 19	Floyd A. Grimes	Bell Creek	Irrigation			
5834	11 6 19	Bugg and Drew	Cinnabar Spring No. 2	Mining	App 10 30 20	0.015 c.f.s.	
5835	11 6 19	Handley Bros.	Unnamed Spring	Stock	App 10 30 20	0.08 c.f.s.	
5836	11 6 19	Handley Bros.	Large Spring	Stock	App 10 30 20	0.015 c.f.s.	
5837	11 6 19	Handley Bros.	Rock Spring	Stock	App 10 30 20	0.015 c.f.s.	
5838	11 6 19	Handley Bros.	Unnamed Spring No. 1	Stock			
5839	11 6 19	Gil Prida & Co.	Underground water	Irrigation			
5840	11 6 19	Gil Prida & Co.	Underground water	Irrigation			
5841	11 6 19	Emma D. Bunch, et al.	Underground water	Irrigation			
5842	11 6 19	W. E. Muldrow	Underground water	Irrigation			
5843	11 7 19	Arthur Gentry	Meadow Valley Creek	Irrigation			
5844	11 7 19	Guy W. Rogers	Unnamed spring	Stock	App 3 10 20	0.025 c.f.s.	
5845	11 7 19	Gustaf R. Peterson	Upper Bellehelen Creek	Irrigation	App 7 3 20	0.166 c.f.s.	
5846	11 8 19	Clarence M. Wedertz	Unnamed springs	Stock			
5847	11 8 19	Guy M. Terry	Camp Spring	Stock	App 8 28 20	0.025 c.f.s.	
5848	11 8 19	Adams McGill Co.	Buffalo Springs	Stock	App 5 25 20	0.015 c.f.s.	
5849	11 8 19	Adams McGill Co.	New York Spring	Stock	App 5 25 20	0.015 c.f.s.	
5850	11 8 19	Adams McGill Co.	Girard Spring	Stock	App 5 25 20	0.015 c.f.s.	
5851	11 8 19	Andrew L. Peterson	Indian Spring	Irrigation	App 6 9 20	0.015 c.f.s.	
5852	11 10 19	Bidart and Florio	American Girl	Stock	Can 3 16 20	0.4 c.f.s.	
5853	11 10 19	W. C. Converse	Greenswood Spring	Stock			
5854	11 12 19	Adams McGill Co.	Unnamed springs	Mining	App 5 18 20	0.06 c.f.s.	
5855	11 12 19	Adams McGill Co.	Rocco Spring	Stock	App 5 25 20	0.015 c.f.s.	
5856	11 12 19	Adams McGill Co.	Clock Spring	Stock	App 5 25 20	0.015 c.f.s.	
5857	11 12 19	Dudley F. Wilson	Kelley Creek	Irrigation			
5858	11 14 19	Adams McGill Co.	Band Spring	Stock	App 5 25 20	0.015 c.f.s.	
5859	11 14 19	Adams McGill Co.	Niagra Spring	Stock	App 5 25 20	0.015 c.f.s.	
5860	11 15 19	Gold Canyon Dredging Co.	American Creek	Mining	App 8 4 20	2.5 c.f.s.	
5861	11 17 19	Fred C. Lancaster	Columbert Creek	Irrigation	App 8 25 20	1.6 c.f.s.	
5862	11 17 19	Chas. W. Erwin	Sand Spring	Mining	Can 3 16 20		
5863	11 17 19	W. L. Blackwell	Tule Spring	Stock	App 3 23 20	0.025 c.f.s.	Can
5864	11 17 19	W. L. Blackwell	Sheep Spring No. 2	Stock	App 11 18 20	0.018 c.f.s.	
5865	11 17 19	W. L. Blackwell	Sheep Spring	Stock			
5866	11 18 19	Jean Cachenaud	Baldwin Canon Creek	Stock	App 7 3 20	0.025 c.f.s.	
5867	11 19 19	W. E. Muldrow	Underground water	Irrigation			
5868	11 21 19	W. M. F. Jenkyn	Ruby Spring	Mining	App 12 9 20	1 c.f.s.	
5869	11 22 19	Buckingham Mines Co.	Cold Springs	Mining	App 10 28 20	1 c.f.s.	
5870	11 24 19	C. F. Kel	Corral Canyon and Springs	Irrigation			
5871	11 24 19	Mary V. Clifford	Five Mile Spring No. 1	Irrigation			
5872	11 26 20	F. D. Brown	Tea Cup Spring	Mining	App 7 1 20	0.26 c.f.s.	
5873	11 26 20	Gregorio Urrutia Co.	Lion Spring	Stock			

APPLICATIONS TO APPROPRIATE WATER—Continued

Serial No.	Date of filing	Applicant	Source	Purpose, including domestic	Action on application	Amount allowed	Action on permit
5926	12 29 19	Thomas Wilson	Granite Canyon Springs	Mining	Can 3 16 20	1,500 acre-feet	
5927	12 29 19	Thomas and Grace Duferrena	Thousand Creek	Irrigation	App 7 3 20		
5928	1 2 20	Gold Note Mining Co.	Lowry Wells	Mining	Can 3 16 20		
5929	1 2 20	Kawich Cattle Co.	Alkali Spring	Stock	App 6 5 20	0.025 c.f.s.	P.B.U.
5930	1 2 20	Kawich Cattle Co.	Stonewall Springs	Stock	App 6 5 20	0.025 c.f.s.	P.B.U.
5931	1 2 20	Kawich Cattle Co.	Jerome Springs	Stock	App 6 5 20	0.025 c.f.s.	P.B.U.
5932	1 3 20	Minnie E. Hider	Hot Springs	Irrigation	App 12 9 20	0.025 c.f.s.	
5933	1 3 20	A. Jensen, Jr.	Buck-Brush Spring	Stock	App 6 25 20	0.2 c.f.s.	
5934	1 5 20	Herman Tiedge	East Carson River	Irrigation	App 6 25 20	0.025 c.f.s.	
5935	1 5 20	Adams McGill Co.	Meloy Well	Stock	Can 3 16 20		
5936	1 5 20	Adams McGill Co.	Underground water	Irrigation			
5937	1 5 20	James E. Burch	Twin Springs	Irrigation			
5938	1 6 20	T. Wellington Dove	Deep Canyon Creek	Mining			
5939	1 6 20	L. L. Redden	Crane Creek	Irrigation			
5940	1 7 20	Canyon Queen Silver Mining & Milling Co.	Meadow Valley Wash	Irrigation			
5941	1 8 20	Mrs. Pearl Huston	Meadow Valley Wash	Irrigation			
5942	1 8 20	Mrs. Pearl Huston	Reef Spring	Mining	App 7 2 20	0.25 c.f.s.	
5943	1 9 20	Jos. V. Murphy	Unnamed spring	Domestic			
5944	1 12 20	Harry E. Anderson	American Flat	Irrigation	App 6 10 20	0.003 c.f.s.	
5945	1 12 20	G. H. & R. S. Carter	Hyde Springs	Stock	App 6 10 20	0.003 c.f.s.	
5946	1 12 20	W. S. Hyde	Willow Springs	Stock	Can 3 16 20		
5947	1 12 20	W. S. Hyde	Indian Creek	Irrigation			
5948	1 12 20	John H. Reeve	Sand Creek	Stock			
5949	1 14 20	Melvorn W. Jones	Murdock Springs	Irrigation			
5950	1 16 20	Vineyard Land and Stock Co.	Artesian wells	Power			
5951	1 16 20	DeLoos M. Webb	McCoy Creek	Power	App 10 28 20	0.5 c.f.s.	
5952	1 19 20	Piermont Mines Co.	O'Toole Spring	Mining	App 12 9 20	1.64 c.f.s.	
5953	1 19 20	Piermont Mines Co.	Robinson Spring	Irrigation	App 7 2 20	0.015 c.f.s.	
5954	1 19 20	Piermont Mines Co.	Underground water	Stock			
5955	1 19 20	Mrs. J. C. Geyman	Spaulding Creek	Irrigation			
5956	1 23 20	H. B. Beers	Hackberry Spring	Stock	App 6 28 20	Chg. div.	
5957	1 23 20	Gustav A. Schmidt	Boulder Creek	Irrigation	App 11 18 20	0.075 c.f.s.	
5958	1 26 20	Geyer Land & Cattle Co.	Five Mile Spring	Milling	App 6 30 20	2.8 c.f.s.	
5959	1 27 20	Sylvain Slard	Truckee River	Irrigation			
5960	1 27 20	Blanche Slard	Wheeler Springs	Stock			
5961	1 28 20	Gil Prida & Co.	Bannan Wash	Irrigation			
5962	1 28 20	Hunt and Bunker	Five Mile Springs	Irrigation			
5963	1 28 20	L. S. Weathers	Brinkerhoff Springs	Stock			
5964	1 28 20	Antone Antoniazzi					
5965	1 29 20	L. H. Murdock					
5966	1 29 20	M. P. Gerahy					
5967	1 31 20	Frank A. Buol					
5968	2 2 20	Dreame Benson					
5969	2 2 20	O. R. Perry					
5970	2 2 20	J. L. Sharp					

5971	2	3	20	I. L. Pierce	Moonlight Spring	Mining			
5972	2	3	20	I. L. Pierce	Luna Spring	Mining			
5973	2	3	20	I. L. Pierce	McNeil Spring	Mining			
5974	2	5	20	Pacific Fruit Express Co.	Humboldt River	Ice			
5975	2	5	20	City of Elko	South Fork Springs	Town supply			
5976	2	6	20	Adams McGill Co.	Black Jack Springs	Stock	App 5 25 20	0.018 c.f.a.	
5977	2	6	20	Adams McGill Co.	Badger Hole Springs	Irrigation	App 5 25 20	0.02 c.f.a.	
5978	2	9	20	Mrs. O. C. Stewart	Barrell Springs	Stock	App 8 28 20	0.003 c.f.a.	
5979	2	10	20	Milo A. Caine	Perritt Springs	Stock	App 8 28 20	0.003 c.f.a.	
5980	2	10	20	Milo A. Caine	Cedar Cornal Springs	Stock	App 8 28 20	0.003 c.f.a.	
5981	2	10	20	Milo A. Caine	Wood Chopper Springs	Stock			
5982	2	10	20	Walter J. Harris	Truckee River	Irrigation			
5983	2	11	20	Samuel Baker	Sam's Creek	Irrigation	App 5 11 20	1.6 c.f.a.	
5984	2	11	20	Union Land and Cattle Co.	Unnamed stream	Irrigation			
5985	2	13	20	Alexander Forsyth	Mississippi Creek	Irrigation			
5986	2	13	20	F. L. Lothrop	Unnamed spring	Stock			
5987	2	14	20	Washoe Land and Cattle Co.	Washoe Lake	Irrigation			
5988	2	15	20	W. J. Davies	Blossom Springs	Irrigation			
5989	2	18	20	Fred Walther	Colorado Slough	Irrigation	App 6 6 20	1.6 c.f.a.	
5990	2	20	20	Frank and Lofthouse	Mulligan Creek Spring	Stock	Can 9 8 20		
5991	2	21	20	J. T. Clark	Willow Creek	Irrigation			
5992	2	23	20	A. W. Gauder	Unnamed spring	Irrigation			
5993	2	24	20	Sylvain Slard	West Walker River	Stock			
5994	2	24	20	Capt. A. N. Stephens	Unnamed spring	Stock			
5995	2	24	20	Geo. J. Westerbeck	Horse Spring	Stock			
5996	2	26	20	Lake Valley Mining Co.	Middle Fork Creek	Irrigation			
5997	2	27	20	E. E. Palmer	Mill Stream	Mining			
5998	3	1	20	H. F. Powell	Lower Indian Springs	Stock			
5999	3	1	20	Warner and Grivic	Willow Spring	Stock	App 12 9 20	0.025 c.f.a.	
6000	3	1	20	Clyde G. Sevier	Star Canyon	Mining			
6001	3	1	20	F. W. Wightman	Rocky Spring	Irrigation	Can 5 18 20		
6002	3	1	20	Amos Roach	Hunt's Well	Stock			
6003	3	1	20	A. L. DeLong	Van Duzer Creek	Irrigation			
6004	3	2	20	Mrs. O. C. Stewart	Leonard Creek	Irrigation			
6005	3	2	20	Muddy Valley Irrigation Co.	Springdale Springs	Stock			
6006	3	5	20	John Adams	Muddy River	Irrigation	Wdn 3 20 20		
6007	3	5	20	Arthur K. Carter	Pony Spring	Stock	App 8 28 20	0.003 c.f.a.	
6008	3	6	20	John Taylor	Mason Creek	Irrigation	App 8 28 20	1.6 c.f.a.	
6009	3	6	20	Edward Brown	Spring Canyon Creek	Irrigation			
6010	3	6	20	James Cashman	Spring Canyon Creek	Irrigation			
6011	3	8	20	C. F. Buffington	Colorado River	Irrigation	App 12 9 20	3.2 c.f.a.	
6012	3	9	20	C. F. Buffington	Muddy Range Wash	Stock	App 10 29 20	3 acre-feet	
6013	3	9	20	C. D. Burkham	Muddy Range flood water	Stock	App 10 29 20	10 acre-feet	
6014	3	10	20	Patrick J. Dolan	Little Square Creek	Irrigation	Can 9 8 20		
6015	3	12	20	H. S. Munroe	Spring Gulch	Irrigation			
6016	3	12	20	J. W. O'Brien	S. Fork Cleve Creek	Power	Can 9 8 20		
6017	3	12	20	Laura Barton	Underground water	Irrigation			
6018	3	15	20	Eugene F. Marker	Corn Creek	Irrigation	App 10 9 20	1 c.f.a.	
6019	3	18	20	Gold Note Mining Co.	Lowry Wells	Mining			
6020	3	19	20	John F. Hesse	Colorado River	Irrigation			
6021	3	20	20	Chatom and Vignolo	Rock Springs	Stock			
6022	3	20	20						

APPLICATIONS TO APPROPRIATE WATER—Continued

Serial No.	Date of filing	Applicant	Source	Purpose, including domestic	Action on application	Amount allowed	Action on permit
6023	3 20 20	Chatom and Vignolo	Coyote Hole	Stock	Can 9 8 20		
6024	3 20 20	Clarence M. Dangberg	Unnamed spring	Stock			
6025	3 22 20	Turner K. Hackman	East Fk. Jarbidge River	Irrigation			
6026	3 23 20	Harvey R. Cushman	Colorado River	Irrigation			
6027	3 23 20	Geo. W. Crofts	Colorado River	Irrigation			
6028	3 23 20	Pyramid Land & Stock Co.	Dry Valley Creek	Irrigation			
6029	3 25 20	Unionville Mining Co.	S. Fk. Buena Vista Creek	Mining			
6030	3 25 20	W. C. Pitt Co.	Subhur Springs	Stock			
6031	3 25 20	Chatom and Vignolo	Speed Spring	Stock			
6032	3 27 20	Harry Dilts	Zenobia Springs	Irrigation			
6033	3 27 20	Sylvian Siard	Mud Springs	Irrigation			
6034	3 29 20	W. C. Pitt Co.	Spring Valley Canyon Sias	Stock			
6035	3 29 20	W. C. Pitt Co.	American Canyon Springs	Stock			
6036	3 29 20	W. C. Pitt Co.	Rawhide Canyon Springs	Stock			
6037	3 29 20	Frank G. Sterrett	Unnamed springs	Irrigation			
6038	3 30 20	Chatom and Vignolo	Middle Indian Spring	Stock	Can 9 8 20		
6039	3 31 20	Gold Pen Mines Co.	Gabbs Valley undegd water	Mining			
6040	4 1 20	Helen D. Williams	Six Mile Creek	Irrigation			
6041	4 1 20	H. T. Brink	Six Mile Creek	Irrigation			
6042	4 1 20	Kate Douglass Hirsh	Underground water	Irrigation			
6043	4 2 20	Herman Tiedge	Willow Canyon Water Hole	Mining			
6044	4 2 20	Ashdown Gold Mines Co.	Carson River	Irrigation			
6045	4 3 20	J. H. Heward	Big Creek and Tributaries	Power			
6046	4 3 20	Sharp Land & Cattle Co.	Rock Creek	Irrigation			
6047	4 3 20	Louis Adams	Spring	Irrigation			
6048	4 3 20	Alma Woods	Virgin River	Irrigation			
6049	4 5 20	Mrs. Maggie Dryer	Good Springs	Stock			
6050	4 9 20	Herman Reischke	Unnamed springs	Domestic			
6051	4 10 20	Gerlach Live Stock Co.	Cottonwood Creek	Irrigation			
6052	4 12 20	H. A. Elander	Monarch Tunnel	Irrigation	App 7 28 20	Chg. div.	
6053	4 14 20	Juan Lawrence	Tank Spring	Stock			
6054	4 14 20	Lino P. Arena	Stoneberzer Creek	Irrigation			
6055	4 14 20	Juan Lawrence	Birch Creek	Irrigation			
6056	4 14 20	Lino P. Arena	Red Spring Creek	Irrigation			
6057	4 14 20	Nay and Marsh	Thunder Mountain Spring	Stock	Can 9 8 20		
6058	4 17 20	John Lusetti	Luasetti Spring	Stock			
6059	4 21 20	C. M. Glider	Unnamed spring	Mining			
6060	4 21 20	Warren Armfield	Virgin River	Irrigation	App 11 9 20	0.008 c.f.a.	
6061	4 21 20	Jon Rosevear	Mud Spring	Stock			
6062	4 22 20	E. E. Palmer	Species Spring	Stock			
6063	4 23 20	Thos. H. Sager	Virgin River	Irrigation			
6064	4 24 20	W. C. Denny	Spring in Silver Park Gulch	Stock			
6065	4 24 20	S. U. Stewart, et al.	Tunnel Springs	Stock			
6066	4 26 20	Ray Stewart, et al.	Shafer Springs	Stock			
6067	4 26 20						

6088	4 26 20	S. U. Stewart, et al.	Seeps Spring	Stock					
6089	4 26 20	S. U. Stewart, et al.	Horse Springs	Stock					
6090	4 26 20	S. U. Stewart, et al.	Monte Springs	Stock					
6091	4 26 20	Louis A. Yelland	Willow Springs	Stock					
6092	4 26 20	Louis A. Yelland	Lower Sulphur Spring	Stock					
6093	4 26 20	Louis A. Yelland	Upper Sulphur Spring	Stock					
6094	4 26 20	Louis A. Yelland	Basin Spring	Stock					
6095	4 26 20	Louis A. Yelland	Cottonwood Spring	Stock					
6096	4 30 20	R. B. Mathews	Black Canyon and Triba	Stock					
6097	4 30 20	R. B. Stewart	Pumpernickel Springs	Irrigation	App 8 30 20	1.6 c.f.s.			
6098	4 30 20	Henry Engle Richard	White Rock Creek	Mining					
6099	4 30 20	Fred Walters	Point of Rock Spring	Irrigation					
6100	4 30 20	Ray Lant & Stock Co.	Moulligan Creek Spring	Stock	Can 9 8 20				
6101	4 30 20	Robert T. Bass	Shank's Canon	Irrigation					
6102	5 1 20	E. E. Palmer	Unnamed Spring	Stock					
6103	5 1 20	Jos. J. Riffe	Upstream Springs	Irrigation	Wdn 6 25 20				
6104	5 3 20	Pete Marluch	Zenobia Creek	Stock					
6105	5 3 20	Pete Marluch	Locket Spring	Stock					
6106	5 4 20	Ethel Gulley	Wild Cat Creek	Stock					
6107	5 4 20	Ethel Gulley	Lanollie Spring	Irrigation					
6108	5 5 20	John Brashaw Co.	Sunflower Creek	Irrigation	Can 9 8 20				
6109	5 5 20	Mary C. Papapavlos	Lanollie Creek	Irrigation					
6110	5 5 20	A. W. C.	Logan Spring	Mining	Can 9 8 20				
6111	5 5 20	Frank B. Keever	Mandalay Springs	Mining	App 11 17 20	2 c.f.s.			
6112	5 6 20	S. C. Cassidy	West Side Spring	Stock					
6113	5 6 20	Henry Lee, et al.	Conaway Spring	Stock					
6114	5 6 20	Henry Lee, et al.	Smokely Creek	Irrigation					
6115	5 7 20	Nevada & California Land & Live Stock Co.	Two Mile Spring	Stock	App 10 30 20	0.005 c.f.s.			
6116	5 7 20	Pahrump Valley Co.	Three Mile Spring	Stock	App 10 30 20	0.005 c.f.s.			
6117	5 7 20	Pahrump Valley Co.	Wild Grapevine Spring	Stock	App 10 30 20	0.005 c.f.s.			
6118	5 7 20	Pahrump Valley Co.	Artesian Wells	Irrigation	App 10 30 20	2 c.f.s.			
6119	5 7 20	Pahrump Valley Co.	Meadow Valley Stream	Irrigation	App 10 30 20	0.5 c.f.s.			
6120	5 8 20	Joseph McGuffie	Shallow Spring	Stock	Can 9 8 20				
6121	5 8 20	James Ryan, et al.	Big Spring	Stock	Can 9 8 20				
6122	5 10 20	W. C. P. O'Brien	Rock Spring	Stock					
6123	5 10 20	James Harat, Jr.	Unimpe	Irrigation	Can 9 8 20				
6124	5 10 20	Henry Harat, Jr.	Unimpe	Stock	Can 9 8 20				
6125	5 10 20	Henry Harat, Jr.	Unimpe	Stock	Can 9 8 20				
6126	5 10 20	Henry Harat, Jr.	Unimpe	Stock	Can 9 8 20				
6127	5 10 20	Henry Harat, Jr.	Unimpe	Stock	Can 9 8 20				
6128	5 10 20	Henry Harat, Jr.	Unimpe	Stock	Can 9 8 20				
6129	5 12 20	A. H. Norris	Willow Spring	Stock	Can 9 8 20				
6130	5 12 20	M. A. Castle	Spring's Springs	Stock					
6131	5 13 20	Dr. D. A. Smith	Silver Chief Spring	Mining					
6132	5 13 20	Dr. D. A. Smith	Smith Springs	Mining					
6133	5 13 20	Levi Synhus	Virzth River	Irrigation	Can 9 8 20				
6134	5 13 20	Lance Anderson	Two unnamed springs	Irrigation					

APPLICATIONS TO APPROPRIATE WATER—Continued

Serial No.	Date of filing	Applicant	Source	Purpose, including domestic	Action on application	Amount allowed	Action on permit
6120	5 14 20	Fritz Elges	Graham Springs	Stock			
6121	5 14 20	H. F. Dangberg Land & Live Stock Co.	Rattlesnake Springs	Stock			
6122	5 14 20	Sylvain Stard	Spring Creek	Stock			
6123	5 14 20	Sylvain Stard	Unnamed spring	Irrigation			
6124	5 15 20	Fritz Fricke	East Carson River	Irrigation			
6125	5 17 20	Thos. H. Sager	Virgin River	Irrigation			
6126	5 17 20	Benj. C. Grainger, Inc.	Maynard Lake and tribs.	Mining			
6127	5 17 20	Western Chemicals, Inc.	Coyote Hole	Irrigation			
6128	5 17 20	J. M. Chiatovich	Chiatovich Creek	Stock			
6129	5 17 20	D. D. Sabala	Sabala No. 1 Spring	Stock			
6130	5 17 20	D. D. Sabala	Sabala No. 2 Spring	Stock			
6131	5 18 20	Devereaux Goodale	Stevens Creek	Irrigation			
6132	5 21 20	Wm. Lamb	Hoyt Spring	Irrigation			
6133	5 21 20	Earl Allen Woodward	Pass Creek	Irrigation			
6134	5 24 20	Western Chemicals, Inc.	North Spring	Mining			
6135	5 24 20	Western Chemicals, Inc.	Coyote Holes	Mining			
6136	5 27 20	Basco Mining Co.	Furlong Creek	Power			
6137	5 27 20	Basco Mining Co.	Furlong Creek	Power			
6138	5 28 20	Sylvain Stard	Unnamed springs	Stock			
6139	5 28 20	Sylvain Stard	Unnamed springs	Stock			
6140	5 28 20	Sylvain Stard	Pole Creek and springs	Stock			
6141	5 28 20	Pietro Pierini & Bros.	Carson River	Irrigation			
6142	5 29 20	Jean Cachena	Unnamed springs	Stock			
6143	6 1 20	Clyde G. Sevier	Rockey Spring	Irrigation			
6144	6 1 20	Abner O. Wilson	Shoshone Creek	Irrigation			
6145	6 1 20	Harry L. Clark	Cow Creek and springs	Irrigation			
6146	6 1 20	William J. Gardner	Gardiner Spring	Stock	App 10 28 20	1.6 c.f.s.	
6147	6 3 20	Dan Devaney	Cottonwood Creek	Irrigation			
6148	6 3 20	Herbert H. Landers	McClellana Creek	Irrigation			
6149	6 4 20	John L. Sevy	Logan Spring	Mining			
6150	6 4 20	John L. Sevy	Box Spring	Stock			
6151	6 5 20	Jean P. Etchart	Hill Spring	Stock	Can 9 8 20		
6152	6 5 20	Jean P. Etchart	Willow Spring	Stock			
6153	6 5 20	Jean P. Etchart	New Spring	Stock			
6154	6 7 20	G. E. Batchelder, et al.	A well	Irrigation			
6155	6 7 20	W. V. Walker	The Seeps	Stock			
6156	6 7 20	Edward Goodale	Boulder Creek	Irrigation	Can 9 8 20		
6157	6 7 20	Frederick H. Jackson	Mustang Spring	Stock	Can 9 8 20		
6158	6 7 20	Ben Grainger, et al.	Pahranagat Lake	Irrigation			
6159	6 8 20	Sylvain Stard	Unnamed spring	Stock			
6160	6 8 20	Sylvain Stard	Unnamed spring	Irrigation			
6161	6 8 20	Sylvain Stard	Unnamed spring	Stock			
6162	6 8 20	C. B. Burkham	Little Squaw Creek	Irrigation			
6163	6 8 20	Cernon Jeffcott	Hidden Springs	Irrigation			
6164	6 10 20	M. A. Morley	Shedd's Gulch	Irrigation			

6165	Clarence S. Munson	6 10 20	Artesian well	Irrigation	
6166	R. M. Hotaling	6 10 20	Carson River	Irrigation	
6167	Claud V. Meecham	6 11 20	Lexington Creek	Irrigation	
6168	J. W. Mallory	6 12 20	Little Squaw Creek	Irrigation	
6169	Moapa and Salt Lake Produce Co.	6 14 20	Muddy River	Irrigation	
6170	Mike Sala	6 16 20	Black Rock Spring	Stock	
6171	Edging and Granger	6 16 20	Maynard Spring	Domestic	
6172	Griswold-Henderson Land & L. S. Co.	6 16 20	Rasco Spring No. 2	Stock	
6173	Griswold-Henderson Land & L. S. Co.	6 16 20	Rasco Spring	Stock	
6174	Griswold-Henderson Land & L. S. Co.	6 16 20	Rasco Spring No. 1	Stock	
6175	United Cattle & Packing Co.	6 17 20	Woodchopper Spring	Stock	
6176	L. Snyder	6 17 20	Squaw Berry Spring	Stock	
6177	Nevada Valleys Power Co.	6 17 20	Underground waters	Manufacturing	Can 10 6 20
6178	Floyd J. Keller	6 18 20	Rock Cabin Creek	Irrigation	Can 10 6 20
6179	Floyd J. Keller	6 18 20	Iowa Creek and Tributary	Irrigation	Can 10 6 20
6180	Juan Uhart	6 19 20	Unnamed spring	Stock	App 10 28 20
6181	Juan Uhart	6 19 20	Unnamed spring	Stock	App 10 28 20
6182	Geo. D. Ernst	6 19 20	Old River	Irrigation	Can 12 8 20
6183	J. C. Tognoni	6 19 20	Little Warm Spring	Irrigation	
6184	W. A. Moore	6 21 20	Man Spring	Irrigation	
6185	Wm. Laird	6 22 20	Water Canyon Creek	Irrigation	
6186	J. B. Gallagher, et al.	6 23 20	Walker River	Power	
6187	Miller-Hamilton Mining Co.	6 23 20	Six Mile Canyon Springs	Irrigation	
6188	Nevada Wonder Mining Co.	6 23 20	Thunder Mountain Spring	Stock	
6189	Marrah and Nay	6 23 20	Mt. Anne Springs	Stock	Can 12 8 20
6190	G. W. O'Neill	7 2 20	Rose Springs	Stock	
6191	Peters Bros.	7 2 20	Underground water	Irrigation	
6192	Holcomb Bros.	7 3 20	Underground water	Irrigation	
6193	S. R. Young	7 3 20	Beaver Creek	Irrigation	
6194	Frank Benane	7 3 20	Sheep Creek	Irrigation	
6195	Ida Teixeira	7 3 20	Sabala Spring No. 3	Stock	
6196	D. D. Sabala	7 5 20	Sabala Spring No. 4	Stock	
6197	D. D. Sabala	7 5 20	Sabala Spring No. 5	Stock	
6198	D. D. Sabala	7 5 20	Rabbit Brush Spring	Stock	
6199	W. T. Stewart, Jr.	7 5 20	Unnamed spring	Stock	Can 10 6 20
6200	Oliver Iverson	7 10 20	Coyote Wells	Irrigation	
6201	J. F. Foremaster, et al.	7 12 20	Justi Wells	Stock	
6202	J. F. Foremaster, et al.	7 12 20	Bradshaw Spring	Stock	
6203	Gardner Ranch Co.	7 14 20	Cottonwood Creek	Irrigation	
6204	David Beebe	7 15 20	Willow Spring	Mining	
6205	R. J. Pierson	7 16 20	San Juan Creek	Power	
6206	Wm. Easton	7 16 20	Buck Creek	Irrigation	
6207	J. J. Riffe	7 17 20	Indian Gulch	Irrigation	
6208	T. L. Chaney	7 24 20	Grassy Spring	Stock	
6209	John Uhalde	7 26 20	Galch Spring	Stock	
6210	John Uhalde	7 26 20	Uhalde Spring	Stock	
6211	John Uhalde	7 26 20	Cottonwood Spring	Mining	
6212	A. G. Cummings	7 26 20	Pussy Willow Spring	Stock	Can 10 6 20
6213	Gus Pendleton	7 26 20	Big Horn Spring	Stock	Can 10 6 20
6214	Gus Pendleton	7 26 20	Red Hill Spring	Stock	Can 10 6 20
6215	Gus Pendleton	7 26 20	Red Pockets Spring	Stock	Can 10 6 20
6216	Gus Pendleton	7 26 20	Red Pockets Spring	Stock	Can 10 6 20

APPLICATIONS TO APPROPRIATE WATER—Continued

Serial No.	Date of filing	Applicant	Source	Purpose, including domestic	Action on application	Amount allowed	Action on permit
8217	7 26 20	Gus Pendleton.	Earthquake Canyon Pocket	Stock	Can 10 6 20		
8218	7 26 20	Gus Pendleton.	Deception Pass Pocket.	Stock	Can 10 6 20		
8219	7 26 20	James M. Leonard.	Unnamed spring	Irrigation	App 11 9 20	0.2 c.f.s.	
8220	7 26 20	Griswold-Henderson Live Stock Co.	Unnamed spring	Irrigation			
8221	7 26 20	Griswold-Henderson Live Stock Co.	Unnamed spring	Irrigation			
8222	7 26 20	Griswold-Henderson Live Stock Co.	Unnamed spring	Irrigation			
8223	7 26 20	Griswold-Henderson Live Stock Co.	Unnamed spring	Irrigation	Can 12 8 20		
8224	7 26 20	Griswold-Henderson Live Stock Co.	Unnamed spring	Irrigation			
8225	7 30 20	Angelo Depaoli	Simpson Creek	Irrigation			
8226	7 30 20	Riverside Mill Co.	Truckee River	Power			
8227	8 4 20	Dan Devaney	Unnamed spring	Stock			
8228	8 4 20	Nevada Wilson Ext. Mining Co.	Cedar Spring	Mining			
8229	8 6 20	Pete Laborde	Cottonwood Creek	Irrigation	Wdn 9 3 20		
8230	8 9 20	W. J. Gardner.	Big Minnow Springs	Irrigation			
8231	8 9 20	T. L. Chaney	Dutch Creek.	Irrigation			
8232	8 10 20	Copper Canyon Mining Co.	Underground water	Mining			
8233	8 11 20	Blanche Siard	Pleasant Valley Cr. and triba.	Irrigation			
8234	8 12 20	Pine Forest Mining Co.	Dyke Hot Springs	Mining			
8235	8 14 20	Gracian Saldubere	Unnamed well	Stock			
8236	8 14 20	Henry A. Williams, et al.	Walker River	Irrigation			
8237	8 16 20	D. A. Johnson.	Dyke Gulch	Mining			
8238	8 16 20	Star of the West Mining Co.	Star Spring	Mining			
8239	8 19 20	Star of the West Mining Co.	Artic Spring	Mining			
8240	8 23 20	E. A. Henriod	Lotes Creek	Stock			
8241	8 23 20	Lyon County Drainage District No. 1	Underground water	Irrigation	Can 11 24 20		
8242	8 25 20	D. H. Walworth	Buck Brush Spring	Irrigation			
8243	8 26 20	Quillet Bros.	Carson River	Irrigation			
8244	8 30 20	Betty O'Neal Mines	Whiskey Springs	Mining			
8245	8 30 20	Alice A. Sellas	Rosebush Spring	Stock			
8246	8 30 20	Andre Dornecq	Willow Spring	Stock			
8247	8 30 20	W. C. Pitt Co.	Hot Springs Can. Springs	Stock	Can 12 8 20		
8248	9 1 20	James Crisp, et al.	Deer Creek	Irrigation			
8249	9 2 20	Handley Bros.	Blind Springs No. 1	Stock			
8250	9 2 20	Handley Bros.	Blind Springs No. 2	Stock			
8251	9 4 20	Pete Laborde	Cottonwood Creek	Irrigation			
8252	9 4 20	Niels C. Frendezen	Coyote Creek	Irrigation			
8253	9 9 20	John W. Morton	Chlatovich Creek	Irrigation			
8254	9 9 20	John B. Sili	James White Spring	Irrigation			
8255	9 9 20	Clarence Butt.	Deep Creek	Irrigation			
8256	9 10 20	Fred O. Morse	Victory Spring	Mining			
8257	9 10 20	E. A. and F. Henriod	S. F. Grass Valley	Irrigation			
8258	9 10 20	E. A. and F. Henriod	Middle Fork Grass Valley	Irrigation			
8259	9 11 20	Harry N. Anderson	Artesian Wells	Irrigation			
8260	9 13 20	Richard Lee	Cold Springs	Irrigation			
8261	9 16 20	Alma Leavitt	Unnamed spring	Stock			

6282	9 15 20	Alma Leavitt	Nickel Creek	Stock		
6283	9 15 20	John Hickson	Unnamed spring	Stock		
6284	9 15 20	John Hickson	Unnamed spring	Stock		
6285	9 17 20	Angelo Cartago	Rock Springs	Irrigation		
6286	9 17 20	Pietro Pierini	Carson River	Irrigation		
6287	9 18 20	Edward E. Van Riper	Nellie Spring	Irrigation		
6288	9 23 20	J. W. Gallagher, et al.	Mud Lake	Irrigation		
6289	9 25 20	John B. Bradshaw Co.	Sunflower Creek	Irrigation		
6290	9 25 20	Aaron Peterson	Cottonwood Creek	Irrigation		
6291	9 27 20	Joe Malatesta	Malatesta Spring	Stock		
6292	9 28 20	W. H. Van Eaton	Dave Creek	Irrigation		
6293	9 29 20	W. H. Russell	Unnamed spring	Irrigation		Wdn 11 15 20
6294	9 29 20	Javier Goyeneche	Goyeneche Spring No. 1	Stock		
6295	9 29 20	Javier Goyeneche	Goyeneche Spring No. 2	Stock		
6296	9 29 20	Javier Goyeneche	Goyeneche Spring No. 3	Stock		
6297	9 29 20	Javier Goyeneche	Goyeneche Spring No. 4	Stock		
6298	9 29 20	Javier Goyeneche	Goyeneche Spring No. 5	Stock		
6299	9 29 20	Javier Goyeneche	Goyeneche Spring No. 6	Stock		
6300	9 29 20	Javier Goyeneche	Goyeneche Spring No. 7	Stock		
6301	9 29 20	Javier Goyeneche	Goyeneche Spring No. 8	Stock		
6302	9 29 20	Javier Goyeneche	Goyeneche Spring No. 9	Stock		
6303	9 29 20	Javier Goyeneche	Goyeneche Spring No. 10	Stock		
6304	9 29 20	Javier Goyeneche	Goyeneche Spring No. 11	Stock		
6305	9 29 20	Javier Goyeneche	Goyeneche Spring No. 12	Stock		
6306	9 29 20	Javier Goyeneche	Goyeneche Spring No. 13	Stock		
6307	10 2 20	John W. Morgan	Dave Spring	Irrigation		
6308	10 4 20	E. A. Henriad	Burlington Canon	Stock		
6309	10 4 20	J. W. Henriad	Morgan Spring	Stock		
6310	10 4 20	E. A. Henriad, et al.	Lower Callahan Spring	Stock		
6311	10 4 20	E. A. Henriad, et al.	Castle Valley	Stock		
6312	10 4 20	E. A. Henriad, et al.	Yellow Spring	Stock		
6313	10 4 20	E. A. Henriad, et al.	Cottonwood Spring	Stock		
6314	10 5 20	Goldsmith and Lynch	Shermantown Springs	Mining		
6315	10 7 20	Lee and Keele	Unnamed spring	Stock		
6316	10 11 20	Lay Land & Stock Co.	Shank's Canon	Irrigation		
6317	10 12 20	Wm. Vetter	Wheeler Spring	Stock		
6318	10 12 20	Wm. Vetter	Bell Spring	Stock		
6319	10 12 20	Wm. Vetter	Trough Spring	Stock		
6320	10 12 20	Wm. Vetter	Buck Spring	Stock		
6321	10 12 20	Wm. Vetter	Rosebud Spring	Stock		
6322	10 12 20	Wm. Vetter	Ione Canyon	Stock		
6323	10 18 20	Patrick W. McMahon	Deception Pass Pocket	Irrigation		
6324	10 18 20	Gus Pendleton	Pussey Willow Spring	Stock		
6325	10 18 20	Gus Pendleton	Red Hill Spring	Stock		
6326	10 18 20	Gus Pendleton	Big Horn Spring	Stock		
6327	10 18 20	Gus Pendleton	Earthquake Canon Pockets	Stock		
6328	10 18 20	Gus Pendleton	Red Pockets	Stock		
6329	10 19 20	State of Nevada Insane Asylum	Truckee River	Irrigation		
6330	10 20 20	Giovanni Bottini	Truckee River	Power		
6331	10 21 20	Alice E. Luce	S. Fk. Owyhee River	Irrigation		
6332	10 29 20	Ethel Dean Hussey	Mill Creek	Irrigation		
6333	11 1	C. I. Burt	Unnamed spring	Mining		

APPLICATIONS TO APPROPRIATE WATER—Continued

Serial No.	Date of filing	Applicant	Source	Purpose, including domestic	Action on application	Amount allowed	Action on permit
6314	11 1 20	C. I. Burt	Unnamed spring	Mining	-----	-----	-----
6315	11 3 20	S. P. Osborne	Churchill Canyon	Irrigation	-----	-----	-----
6316	11 3 20	C. H. Jones	Unnamed spring	Powr	-----	-----	-----
6317	11 4 20	D. H. Walworth	Pole Creek	Irrigation	-----	-----	-----
6318	11 5 20	Don V. Cooper	Pleasant Valley Creek	Irrigation	-----	-----	-----
6319	11 5 20	Fred A. Murphy	Himes Creek	Irrigation	-----	-----	-----
6320	11 5 20	John Delfs	Pocopah Spring	Stock	-----	-----	-----
6321	11 5 20	John Delfs	Crystal Spring	Stock	-----	-----	-----
6322	11 5 20	Orlando Pace	Springs	Irrigation	-----	-----	-----
6323	11 10 20	Palrump Valley Co.	Oak Springs	Stock	-----	-----	-----
6324	11 15 20	Brown and Chiam	Ash Spring	Irrigation	-----	-----	-----
6325	11 17 20	Brown and Chiam	Ash Spring	Powr	-----	-----	-----
6326	11 17 20	Brown and Chiam	Ash Creek Spgs. and tribs.	Irrigation	-----	-----	-----
6327	11 17 20	Frank Murphy	Willow Creek	Irrigation	-----	-----	-----
6328	11 18 20	Frank Murphy	Buck Creek	Irrigation	-----	-----	-----
6329	11 19 20	Walter E. Tregaskis	Shvator Creek	Irrigation	-----	-----	-----
6330	11 19 20	G. E. Purdy	Churchill Canyon	Irrigation	-----	-----	-----
6331	11 22 20	Wm. M. Read	Springs	Milling	-----	-----	-----
6332	11 22 20	Jon Yasuni	Yasuni Springs	Irrigation	-----	-----	-----
6333	11 22 20	Clarence C. Higgins	Dave Creek	Irrigation	-----	-----	-----
6334	11 26 20	C. V. Cole	Mantley Creek	Irrigation	-----	-----	-----
6335	11 26 20	John Murray	Beth Bath Spring	Stock	-----	-----	-----
6336	11 26 20	Lionard Land & Livestock Co.	Washoko Springs	Stock	-----	-----	-----
6337	11 27 20	Vernon Jeffcott	Geo. Rodgers Spring	Stock	-----	-----	-----
6338	11 29 20	Vernon Jeffcott	Klondike Springs	Stock	-----	-----	-----
6339	11 29 20	Lyon County Drainage District No. 1	Underground water	Irrigation	-----	-----	-----
6340	11 30 20	Martin Ametoy	Granite Spring	Stock	-----	-----	-----
6341	11 30 20	Martin Ametoy	Willow Spring	Stock	-----	-----	-----
6342	11 30 20	Martin Ametoy	Underwood Spring	Stock	-----	-----	-----
6343	11 30 20	Martin Ametoy	Farin Spring	Stock	-----	-----	-----
6344	11 30 20	Martin Ametoy	Pine Mountain Spring	Stock	-----	-----	-----
6345	11 30 20	Martin Ametoy	Middle Spring	Stock	-----	-----	-----
6346	12 2 20	Steele and Sawyer	Flying Machine Spring	Stock	-----	-----	-----
6347	12 2 20	Steele and Sawyer	Hunting Bird Spring	Stock	-----	-----	-----
6348	12 2 20	W. F. Dressler	Dressler Spring No. 2	-----	-----	-----	-----
6349	12 2 20	W. F. Dressler	Dressler Spring No. 3	-----	-----	-----	-----
6350	12 2 20	W. F. Dressler	Dressler Spring No. 4	-----	-----	-----	-----
6351	12 2 20	W. F. Dressler	-----	-----	-----	-----	-----
6352	12 2 20	Tony Longero	-----	-----	-----	-----	-----
6353	12 6 20	Pete Lambert	Cottonwood Spring	Irrigation	-----	-----	-----
6354	12 6 20	Pete Lambert	Log Cabin Spring	Stock	-----	-----	-----
6355	12 6 20	Pete Lambert	Cherry Spring	Stock	-----	-----	-----
6356	12 8 20	W. C. Pitt Co.	Hot Spring Canyon Springs	Stock	-----	-----	-----

6357	12 9 20	B. L. & T. F. Minor	McConnell and Buffalo Crks.	Irrigation
6358	12 10 20	Arthur K. Carter	Mason Creek	Irrigation
6359	12 21 20	J. J. Hyton	North Fork Humboldt River	Irrigation
6360	12 22 20	Steven Dautre	Van Emon Springs	Irrigation
6361	12 22 20	Steven Dautre	Van Emon Spring No. 8	Irrigation
6362	12 23 20	John P. Foremaster	Granger Spring	Irrigation
6363	12 23 20	Carl E. Foremaster	Bill Lamb Spring	Irrigation
6364	12 23 20	John W. Richard	Coyote Holes	Irrigation
6365	12 27 20	L. L. Woods, Jr.	Becco Spring	Stock
6366	12 27 20	W. H. Berg	Belcher Creek	Irrigation

**STATUS OF APPLICATIONS FILED PRIOR TO JANUARY 1, 1919, UPON WHICH ACTION HAS BEEN TAKEN
DURING THE YEARS 1919-1920**

(NOTE—Amount in cubic feet per second unless otherwise specified.)

Serial No.	Date of filing	Applicant	Source	Purpose, including domestic	Action on application	Amount allowed	Status of permit
150	7 7 06	G. B. Williams.	Skull and Road Canyon.	Irrigation	App 11 1 06	1.192	Cert
216	9 29 06	Joseph Tognoni	Big Warm Spring	Irrigation	App 9 16 08	16.86	P.B.U.
920	4 16 08	William Hamilton	Shingle Creek	Irrigation	App 5 10 08	5	P.B.U.
1040	6 5 08	Metropolis Land Co.	Bishop Creek	Irrigation	App 6 29 09	25	P.B.U.
1044	7 10 08	Fermina Sarrias	Rose Spring	Mining	App 2 23 10	All unappropriated	Can
1104	8 28 08	H. R. Plate	Crocker Creek	Mining, mill, & power	App 1 26 09	25	Can
1117	9 5 08	Frank H. Winters	Bruneau River	Power and irrigation	App 3 20 09	All unappropriated	Can
1312	3 1 09	J. C. Tognoni	Little Warm Spring	Irrigation	App 11 11 14	1.3	Can
1316	3 13 09	W. F. Dressler	West Carson River	Irrigation	App 6 3 10	33	P.B.U.
1449	10 7 09	Wm. M. Rollin, et al.	Walker River	Irrigation	App 2 16 11	6	P.B.U.
1529	11 22 09	John Angell	Van Duzer Creek	Irrigation	App 2 18 11	3.2	Can
1575	1 12 10	E. B. Robinson	Pine Creek	Irrigation	App 3 1 11	25	P.B.U.
1611	2 14 10	Muddy Valley Irrigation Company	Muddy River	Irrigation	Den 4 9 20	37.6	Can
1655	4 12 10	Thos. H. Fitzgerald	Virgin River	Irrigation	App 9 2 10	3.2	Cert
1660	4 16 10	Katie Hartman, et al.	N. Ft. Cottonwood Creek	Irrigation	App 3 6 11	1	P.B.U.
1703	6 1 10	Albert Welch	Boulder Creek	Irrigation	App 12 12 14	1.6	P.B.U.
1715	6 11 10	Leland S. Weathers	Ackler Creek	Irrigation	App 11 27 14	1.6	P.B.U.
1721	6 14 10	Joseph Jeanney	American Flat Run Off	Irrigation	App 11 29 10	16	Cert
1735	6 29 10	Geo. H. Carter, et al.	Carson River	Irrigation	App 11 29 10	0.5	P.B.U.
1774	8 1 10	Wm. C. Anderson	Marys River	Irrigation	Den 4 10 19	0.5	Can
1893	11 26 10	Carey Act Reclamation Association	Water Canyon Spring	Mining	App 10 12 11	0.5	Cert
1927	1 6 11	D. S. Dickerson	Springs Nos. 1 and 2	Irrigation	App 7 17 11	1.6	Can
1929	1 9 11	Alexander Eyrand	Taber Creek	Irrigation	Den 4 10 19	1.6	Cert
1862	3 12 11	Carey Act Reclamation Association	Buto Springs	Irrigation	App 10 12 11	2,880 acre-feet	P.B.U.
2006	4 13 11	John C. Buto	Snow streams	Irrigation	App 7 1 11	3.2	Cert
2014	4 14 11	Henry Anderson	Donnelly Creek	Irrigation	App 7 1 11	3.2	P.B.U.
2067	5 15 11	William States	Buck Creek	Irrigation	App 8 22 12	1.6	P.B.U.
2069	5 17 11	B. B. Laros	Humboldt River	Irrigation	App 11 25 14	1.6	Cert
2059	5 19 11	Mathew Gooch	White's Creek	Irrigation	App 12 12 11	11	P.B.U.
2062	6 19 11	John E. Schrener	Lamolle Creek	Power	App 2 14 12	1.6	Cert
2090	6 6 11	Elko-Lamolle Power Co.	North Miller Basin Creek	Irrigation	App 9 7 11	1.6	Cert
2091	6 7 11	Bert Shedd, et al.	East Carson	Change diversion	App 1 8 12	0.67	Cert
2092	6 7 11	William Condon	Trout Canyon Creek	Irrigation	App 5 3 17	0.67	Cert
2186	6 8 11	H. F. Dangberg L. & L. S. Co.	Lee's or Pine Creek	Irrigation	Den 3 22 20	7.2	Can
2098	6 10 11	Oasis Land Co.	Angel's Creek	Irrigation	Den 3 22 20	7.2	Can
2099	6 16 11	Richard C. O'Neill	Owyhee River	Irrigation	App 7 28 19	3.2	Cert
2107	6 30 11	Oscar Miller	Springs	Irrigation	App 10 21 12	10	Can
2129	8 31 11	James H. Burtner	Underground waters	Irrigation	Den 4 9 20	10	Cert
2132	8 16 11	H. G. McBride	Unnamed stream	Irrigation	App 6 24 12	2.4	Can
2184	8 26 11	Case E. Snider	Dry Creek	Irrigation	App 10 18 12	1.6	P.B.U.
2190	9 1 11	H. L. Butler	Dry Creek	Irrigation	App 5 5 14	1.6	P.B.U.

2200	9	9	11	Geo. M. Bower	Lamolle Creek	Irrigation	App 11 19 14	1	Can
2210	9	9	11	Utah Construction Co.	Johnson Creek	Irrigation and stock	App 10 30 12	30	Can
2211	9	16	11	Utah Construction Co.	Squaw Creek	Irrigation and stock	App 10 30 12	20	Can
2216	9	25	11	Frank L. Marker	Trout Creek	Irrigation	App 4 8 12	1.5	Can
2240	10	12	11	Henry Anderson	Peavine Mountain Flood	Irrigation	App 10 21 12	15.9	P.B.U.
2241	10	12	11	Henry Anderson	Silver Lake	Irrigation	App 7 8 12	2.6	P.B.U.
2244	10	16	11	S. P. Santos	Meadow Creek	Irrigation	App 7 8 12	2.6	Cert
2246	10	27	11	Frank S. Leavitt	Cabin Spring	Irrigation	App 2 10 12	3.2	Cert
2248	10	31	11	D. H. Young	Owyhee River	Irrigation	App 2 10 12	100	Can
2270	12	1	11	Oasis Land Co.	Pahrump Valley	Irrigation	App 2 10 12	100	Can
2298	12	16	11	E. B. Robinson	Pine Creek	Chg. of div.	App 5 18 12	3.2	Can
2304	12	24	11	Wm. J. Gardner	Dawley's Creek	Irrigation	App 10 30 12	2.8	Can
2316	1	15	12	Gentile Georgetta, et al.	Choke Cherry Canyon	Irrigation	App 10 23 12	2	Cert
2318	1	16	12	Mrs. M. J. and R. M. Woodward	Jack Creek	Irrigation	App 5 3 15	0.8	Cert
2331	2	5	12	C. C. Turner	Walker River	Irrigation	App 11 25 15	0.88	Cert
2332	2	7	12	Johannes Haug	Monchant Springs	Irrigation	App 11 12	1.33	Cert
2335	2	10	12	Juan Uhart	Chalk Springs	Irrigation	App 8 16 12	1	Cert
2342	2	5	12	W. A. Moore	Fairy Dell Springs	Irrigation	App 11 12	2	Cert
2350	2	26	12	C. H. Behrman	East Carson River	Irrigation	App 4 26 17	1	Cert
2367	3	2	12	Amy M. Prunty	Copper Creek	Irrigation	App 8 15 12	1.6	Cert
2383	3	23	12	Ignacia Leniz	White River	Irrigation	App 5 20 12	0.48	Cert
2384	3	25	12	Edith Gregory, et al.	Snake Creek	Irrigation	App 5 6 13	4.8	Cert
2386	3	25	12	G. B. Leavitt, et al.	Carson River	Irrigation	App 11 12	9.2	Cert
2387	3	26	12	Wm. R. Adams	Rabbit Creek	Irrigation	App 4 26 17	0.4	P.B.U.
2392	3	29	12	James E. Frazier	Rabbit Creek	Irrigation	App 1 21 15	0.76	P.B.U.
2393	3	29	12	James Meyers	Long Valley Water	Irrigation	App 1 21 15	0.9	P.B.U.
2398	4	5	12	Johannes Haug	North Fork Humboldt	Irrigation	App 11 21 12	1	Cert
2419	5	1	12	Marcos F. Phillips	Nine Mile Canyon	Irrigation	App 11 19 14	1.6	Can
2420	5	3	12	S. A. Ruffe, et al.	Sheep Creek	Irrigation	App 5 6 13	5.6	Cert
2436	6	1	12	Frederick W. H. Simmack	Sheep Creek	Irrigation	App 2 4 13	1.6	Cert
2485	8	9	12	E. M. Engelbrecht	Blackhorn Springs	Irrigation and stock	App 2 20 15	0.06	P.B.U.
2490	8	14	12	Daniel C. McKenna	South Fork Owyhee	Irrigation	App 4 14 14	1.4	P.B.U.
2491	8	14	12	John C. Crain	Squaw Valley Creek	Irrigation	App 2 2 14	1.4	P.B.U.
2504	9	7	12	Patrick J. O'Hara	Witherspoon Canon	Irrigation	App 6 9 13	0.8	Can
2511	9	20	12	Stefan Horzog	Humboldt River	Irrigation	App 11 19 14	3	Can
2515	9	23	12	Palo Alto L. & S. Co.	Owyhee River	Irrigation	App 4 14 14	4.8	P.B.U.
2535	10	19	12	Jacob W. Reed	North Fork Deep Creek	Irrigation	App 6 3 13	3.6	P.B.U.
2543	11	7	12	J. H. Dolan, et al.	Snow Bank Creek	Irrigation	App 11 16 14	0.5	P.B.U.
2549	11	13	12	Vineyard L. & S. Co.	Thousand Springs Creek	Irrigation	App 8 23 13	26.8	P.B.U.
2552	11	13	12	Vineyard L. & S. Co.	Warm Springs	Irrigation	App 8 23 13	26.8	Can
2556	11	18	12	Diana M. Hill	Forman Creek	Irrigation	App 6 17 14	6.4	Can
2561	12	7	12	Chas. H. Nickel	Secret Creek	Irrigation	App 2 20 15	1.2	Can
2591	12	23	12	Thos. Holwinkle	Hog Creek Slough	Irrigation	App 12 17 14	2.4	P.B.U.
2609	1	18	13	Thos. H. and Minnie M. Guyon	Clear Creek Springs	Irrigation	App 4 26 17	0.2	P.B.U.
2623	1	30	13	Donald C. Wheeler	Sacramento Canon	Irrigation and stock	App 8 23 13	1.2	P.B.U.
2624	1	30	13	Donald C. Wheeler	East Horse Canon	Irrigation and stock	App 8 23 13	1.2	P.B.U.
2625	3	10	13	Donald C. Wheeler	Van Duzee Canon	Irrigation	App 8 20 14	1.2	Can
2656	3	10	13	J. M. Brown	Peavine Creek	Irrigation	App 5 5 14	0.5	Can
2657	3	10	13	Jasper R. Steiley	South Fk. Humboldt	Irrigation	App 12 29 14	1.6	P.B.U.
2671	3	31	13	Sivert Larsen	Carson River	Irrigation	App 5 8 17	0.85	P.B.U.
2675	4	4	13	Chas. Giardelli	Hot Springs	Irrigation	App 1 28 14	3	P.B.U.
2678	4	8	13	Robt. T. Bath, Jr.	Hot Springs	Irrigation	App 1 28 14	3	P.B.U.

STATUS OF APPLICATIONS—Continued

Serial No.	Date of filing	Applicant	Source	Purpose, including domestic	Action on application	Amount allowed	Status of permit
2701	4 30 13	Alice E. Gardner	Heath's Creek	Irrigation	App 10 10 13	3.2	Cert
2706	5 10 13	Flora A. Ralph	West Squaw Creek	Irrigation	App 11 5 13	2.4	P.B.U.
2714	5 15 13	Henry E. Thompson	Spring	Irrigation	App 1 8 14	0.8	Cert
2725	6 2 13	Mrs. K. Harrison	Egan Creek	Irrigation	App 1 2 14	2	Cert
2727	6 5 13	Ralph McCoy	Shall Canon Creek	Irrigation	App 12 29 14	1.5	P.B.U.
2729	6 7 13	Manuel Machado	Machado Spring	Irrigation	App 11 11 14	0.8	Cert
2732	6 11 13	Mary A. Sara	Robert's Creek	Irrigation	App 11 5 13	0.8	Cert
2739	6 16 13	Gerhard S. Schoer	Willow Creek	Irrigation	App 2 16 14	1.4	P.B.U.
2740	6 16 13	Hilltop Milling and Reduction Co.	Hobo Spring	Mining and milling	App 2 26 15	1	P.B.U.
2743	6 16 13	Wm. Schodde	Slough, Weeks, Leaches Cks.	Irrigation	App 12 30 14	3.2	P.B.U.
2756	7 29 13	Archie T. Cook	Barker Creek and tributaries	Irrigation	App 11 30 14	1.6	P.B.U.
2773	9 11 13	Ruth M. Taylor	Spring City Canyon water	Irrigation	App 12 23 13	3.5	P.B.U.
2790	9 26 13	C. A. Rhea	Cold Springs	Irrigation	App 3 7 14	1.6	Can
2798	10 4 13	Archie T. Cook	Willow Creek	Irrigation	App 9 4 14	1.6	Wdn
2801	10 9 13	B. B. Larios	Buck Creek	Power	App 10 1 14	3.2	Can
2810	10 30 13	Geo. B. William	Camp Creek Spring	Irrigation	App 10 1 14	0.25	Can
2815	10 30 13	Goldfield Cons. Water Co.	Cartee Spring	Mining, etc.	App 5 22 17	25	Can
2824	11 15 13	Adams-McGill Co.	White River Slough	Irrigation	App 5 16 14	0.925	Can
2825	11 18 13	Gerlach Livestock Co.	Granite Creek	Irrigation	App 5 1 16	0.925	Can
2826	11 18 13	Gerlach Livestock Co.	Rock Creek	Irrigation	App 5 1 16	0.925	Can
2844	11 25 13	Douglas Milling and Power Co.	East Fork Carson	Power	App 11 5 14	100	P.B.U.
2859	12 18 13	L. A. Mobery	Donovan Creek	Irrigation	Den 3 22 20	1	P.B.U.
2862	12 19 13	Mrs. Mary Campbell	Bradley Creek	Irrigation	App 1 18 15	1.2	P.B.U.
2868	12 27 13	J. A. Callahan	Underground waters	Irrigation	App 11 5 14	1	P.B.U.
2872	1 8 14	W. T. Smith	Spring	Domestic	App 4 28 17	1	Can
2874	1 14 14	Sylvester Tweedy	Baker and Leham Creeks	Irrigation	App 4 15 14	1.6	Can
2883	1 31 14	W. J. Gardner	Water Canon Creek	Irrigation	App 5 28 14	1.6	Can
2889	2 13 14	Molli Bros.	Robison Creek	Irrigation	App 5 25 14	1.6	P.B.U.
2917	3 17 14	L. A. Mobery	Donovan Creek	Irrigation	Den 3 22 20	1.5928	P.B.U.
2924	3 25 14	Benjamin F. Baker	Queen's Canyon	Irrigation and stock	App 6 3 14	2.4	P.B.U.
2930	3 30 14	Pahrump Valley Co.	Ivanpah Springs	Irrigation	App 6 19 14	1.6	P.B.U.
2941	4 11 14	Chas. Frisbie and F. B. House	Houma Spring	Irrigation	App 9 14 15	1.6	P.B.U.
2942	4 14 14	Mrs. Catherine E. Nelson	Harmony Creek	Irrigation	App 6 25 14	3.8	P.B.U.
2976	5 13 14	Joseph L. Groux	McAfee Creek	Irrigation	App 1 18 15	600 acre-feet	Cert
2982	5 20 14	Mattie Denio	Beaton, Winner, Spring Crs.	Irrigation	App 10 1 14	3.2	P.B.U.
2990	6 1 14	Jean Echard Lore	Anderson Springs	Irrigation	App 8 18 14	3	P.B.U.
3008	6 6 14	Jesse A. Osterhout	Bluff Creek	Irrigation	App 4 3 15	1.6	Can
3021	6 25 14	S. B. Thornton	Buena Vista, Unionville Crk.	Irrigation	App 9 30 15	1.6	P.B.U.
3027	7 2 14	Edith A. Pollard	Lamoille Creek	Irrigation	App 9 15 15	2.4	P.B.U.
3041	7 14 14	G. A. Woodward	Bishop Gulch	Irrigation	App 1 1 15	1.2	P.B.U.
3074	8 13 14	Mike Kortoljannakes	Lamoille Creek	Irrigation	App 11 15	1.6	P.B.U.
3075	8 14 14	Martin Hachquet	Twin Springs	Stock	App 8 26 15	0.025	Cert
3076	8 14 14	Martin Hachquet	Sheep Spring	Stock	App 4 23 15	0.0875	Cert
3077	8 14 14	Martin Hachquet	Phoe Springs	Stock	App 4 23 15	0.0875	Cert
3078	8 14 14	Martin Hachquet	Double Spring	Stock	App 4 23 15	0.03125	Cert

3079	8 14 14	Martin Hachquet	Rock Spring	Stock	App 4 23 15	0.025	Cert
3080	8 14 14	Martin Hachquet	Mahogany Spring	Stock	App 4 23 15	0.0375	Cert
3081	8 14 14	Martin Hachquet	Willow Creek	Stock	App 4 23 15	0.25	Cert
3087	8 19 14	James R. Capell	Sun Creek	Irrigation	App 7 29 15	0.8	Can
3091	8 25 14	Albert Hankins	Smith Creek	Irrigation	App 9 28 15	0.8	P.B.U.
3094	8 29 14	Chas. Gupion	Carico Springs	Irrigation	App 11 6 15	1.6	Can
3104	9 5 14	Geo. W. Smith	North Creek	Irrigation	App 4 12 15	0.8	Can
3106	9 9 14	Angelo Debernardi	Big Canyon Creek	Irrigation	App 4 23 15	0.8	P.B.U.
3127	10 17 14	J. J. Rodenkirch	Elm or Toler Creek	Irrigation	App 6 25 15	2.5	Can
3134	10 13 14	C. L. Burt	Marble Fall Spring	Mining	App 9 30 15	0.5	Can
3139	10 21 14	Elko Water & Light Corporation	Yates Creek	Irrigation	App 12 4 15	400 acre-feet	Can
3141	10 23 14	Alice Carter	Unnamed spring	Stock	App 4 28 17	0.025	P.B.U.
3142	10 23 14	Robert Reid	Unnamed spring	Stock	App 4 28 17	0.025	P.B.U.
3153	11 2 14	R. F. Guley	Meadow Creek	Irrigation	App 4 29 15	1.6	Can
3159	11 5 14	Emmanuel Molini, Jr.	Robinson, Perry, Aiken Cks.	Irrigation	App 6 11 15	1.2	P.B.U.
3160	11 5 14	Cornelius M. McGinnis	Robinson Creek	Irrigation	App 7 2 15	2.8	Can
3177	11 21 14	Lander County Livestock Co.	Hall Creek	Irrigation	App 11 1 15	3.2	Can
3178	11 21 14	John Miles	Jake's Valley Wash	Irrigation	App 10 11 15	1,500 acre-feet	Can
3185	11 27 14	Mrs. John H. Cahill	76 Creek	Irrigation	App 5 3 15	1.2	P.B.U.
3188	11 28 14	Adelaide E. Martin	Gray's Creek	Irrigation	App 12 29 15	1.2	Can
3204	12 10 14	Leopoldo Mariani	Carson River	Irrigation	App 5 1 17	0.14	P.B.U.
3207	12 15 14	William C. Anderson	Carson River	Irrigation	App 5 1 17	0.14	P.B.U.
3209	12 19 14	Frank L. Vaaraguirre	Indian Springs	Irrigation	App 5 26 15	0.25	Can
3212	12 21 14	Steve Damele	Slough No. 1	Irrigation	App 11 23 15	1.6	P.B.U.
3213	12 26 14	William T. O'Neil	Slough No. 2	Irrigation	App 7 17 15	1.6	P.B.U.
3214	12 26 14	William T. O'Neil	Slough No. 3	Irrigation	App 7 17 15	1.6	P.B.U.
3215	12 26 14	William T. O'Neil	Slough No. 4	Irrigation	App 7 17 15	1.6	P.B.U.
3216	12 26 14	William T. O'Neil	Slough No. 5	Irrigation	App 7 17 15	1.6	P.B.U.
3217	12 26 14	William T. O'Neil	Slough No. 6	Irrigation	App 7 17 15	1.6	P.B.U.
3218	12 26 14	William T. O'Neil	Slough No. 7	Irrigation	App 7 17 15	1.6	P.B.U.
3219	12 26 14	William T. O'Neil	Slough No. 8	Irrigation	App 7 17 15	1.6	P.B.U.
3220	12 26 14	William T. O'Neil	Slough No. 9	Irrigation	App 7 17 15	1.2	P.B.U.
3221	12 26 14	William T. O'Neil	Slough No. 10	Irrigation	App 7 17 15	2.59	P.B.U.
3222	12 26 14	William T. O'Neil	Slough No. 11	Irrigation	App 7 17 15	2.24	P.B.U.
3237	1 12 15	J. M. Slopansky	Smith Creek	Irrigation	App 7 17 15	4.42	P.B.U.
3242	1 19 15	Katherine Hartman, J. E. Borchard, and Mary Borchard	Virgin River	Irrigation	App 9 16 15	1.2	P.B.U.
3279	2 20 15	Rochester Mines Co.	Spring in Buffalo Canyon	Mining	Den 4 9 20		P.B.U.
3282	2 23 15	Frank M. Markler	Cottonwood Creek	Irrigation	App 9 27 15	0.5	Cert
3284	2 25 15	Geo. Economy	Lamoille Creek	Irrigation	App 5 10 15	0.4	Cert
3298	3 10 15	Preston Irrigation Co.	Preslon Springs	Irrigation	App 8 26 15	1.6	P.B.U.
3299	3 11 15	Ella L. Chick	Bradley Creek	Irrigation	App 1 31 16	283.29 acre-feet	P.B.U.
3304	3 16 15	Frank A. Buol	Underground waters	Irrigation	App 12 10 15	1.6	P.B.U.
3310	3 18 15	Mutual Land Improvement Co.	West Lake	Irrigation	App 12 9 15	3	Can
3343	4 9 15	L. W. Bunney	Stockade Spring	Irrigation	App 6 16 15	2,250 acre-feet	Wdn
3367	4 26 15	Nevada Gold Co.	Gold Heart Canon Creek	Irrigation	App 9 13 15	1	P.B.U.
3372	4 28 15	G. T. Suttle	Crooked Creek	Power and mining	App 11 15 15	1	Can
3376	4 30 15	J. N. Bryan	Sunnyside Creek	Irrigation	App 12 9 15	1.2	P.B.U.
3378	4 30 15	S. T. Wilbur and W. E. Wilbur	Springs	Irrigation	App 12 9 15	1.6	Can

STATUS OF APPLICATIONS—Continued

Serial No.	Date of filing	Applicant	Source	Purpose, including domestic	Action on application	Amount allowed	Status of permit
3380	4 30 15	John A. Sharp	Burch Creek	Irrigation	App 11 24 15	1	P.B.U.
3385	5 8 15	H. D. Porter	Buck Springs	Irrigation	App 10 1 15	1.6	P.B.U.
3387	5 8 15	J. W. Richards	Ash Spring Creek	Irrigation	App 1 21 16	0.11	Cert
3388	5 10 15	Henry A. Leach	Squaw Creek	Irrigation	App 12 30 15	3.2	Can
3391	5 11 15	Alma Tanner	N. & S. Fks Dairy Valley Cr.	Irrigation	App 8 16 16	1.1885	Can
3399	5 17 15	Thos. E. Kimber	S. Fork Dairy Valley Creek	Irrigation	App 7 27 16	0.1	P.B.U.
3408	5 29 15	H. R. Lemaire	Well	Mining	App 1 10 16	0.1	Can
3440	6 15 15	Monitor Valley Land & Cattle Co.	Northerland Springs	Irrigation	App 8 23 16	0.8	P.B.U.
3443	6 18 15	Lewis T. Lewis	Worling Creek	Irrigation	Den 5 19 19		
3447	6 21 15	Gil Prida	Lee Canon Creek	Irrigation	App 5 9 17	0.55	P.B.U.
3456	6 26 15	Benhard Person	Cook Canon	Irrigation	App 5 27 15	1.6	Can
3474	6 29 15	C. H. A. Gerding	Soap Creek	Irrigation	App 10 9 15	0.8	P.B.U.
3476	6 30 15	L. C. Denton and R. F. Shinn	Cottonwood Spring	Stock	App 4 6 17	0.025	Can
3479	6 30 15	John Chevallier	Bruneau River	Irrigation	App 12 30 15	0.5	Can
3480	6 30 15	John Chevallier	Unnamed spring	Irrigation	App 12 30 15	0.5	Can
3481	6 30 15	John Chevallier	Unnamed springs	Irrigation	App 12 30 15	0.5	Can
3492	7 9 15	Ida M. and Geo. M. Campbell	Campbell Springs	Irrigation	App 1 22 16	0.5	Can
3496	7 12 15	Paul B. Martin	Little High Rock Creek	Irrigation	App 6 17 17	0.98	Can
3499	7 12 15	C. C. Blair	Cedar Gulch	Irrigation	App 5 22 17	0.8	Can
3513	7 16 15	Byron A. Bohne	Horse Creek	Irrigation	App 1 5 16	0.8	P.B.U.
3520	7 20 15	Sylvain Siard	Underground waters	Irrigation	App 1 21 16	0.8	P.B.U.
3540	8 9 15	August Siard	Gooseberry Creek	Irrigation	App 7 25 16	0.9	Can
3551	8 9 15	August Siard	Certain Springs	Irrigation	App 7 25 16	0.17	P.B.U.
3554	8 14 15	Frank Wilson and Mary Scott	Unnamed spring	Mining and milling	App 5 1 16	1	Can
3556	8 17 15	Joseph Blackburn	Sunflower Creek	Irrigation	App 1 5 16	2.25	Can
3558	8 20 15	Desiderio Martinez	Beaver Springs	Irrigation	App 1 3 16	0.4	Cert
3563	8 28 15	Western Pacific Railway Co.	Collar and Elbow Springs	Transportation	App 4 14 16	0.153	P.B.U.
3564	9 1 15	Myrtle Beaman	Sespage and surface waters	Irrigation	App 1 22 16	0.4	Can
3570	9 7 15	James Dahl	Galena Creek	Mining	App 9 1 16	2	Can
3571	9 7 15	James Dahl	Galena Creek	Mining	App 9 1 16	2	Can
3575	9 8 15	Lizzie Schoen	Bruneau River	Irrigation	App 1 25 16	0.8	Can
3576	9 8 15	Orville M. Wilson	Hot Springs	Irrigation	App 4 20 16	1.2	P.B.U.
3584	9 20 15	W. J. Davies	Four Mile Slough	Irrigation	App 3 13 16	1.6	Wdn
3586	9 20 15	A. Dory	Barton Springs	Irrigation	App 8 23 16	0.25	P.B.U.
3594	9 27 15	Pahrump Valley Co.	Intermittent Spring	Irrigation	Wdn 9 9 20		
3601	10 2 15	D. B. Shepard	Williams Springs	Domestic	App 2 11 16	0.5	Can
3610	10 11 15	Albin C. Kirkeby	Shepard Springs	Irrigation	App 11 24 16	2	Can
3616	10 13 15	Sylvain Siard	Jim Creek	Irrigation	App 4 24 17	2	Can
3619	10 13 15	Mrs. Blanche Siard	Jim Creek	Irrigation	App 4 24 17	3.2	Can
3622	10 14 15	Atkins-Kroll & Co.	Unnamed springs	Mining	App 5 5 16	0.25	Can
3630	10 18 15	Gil Prida	Pollard Creek	Irrigation	App 7 27 16	1.6	P.B.U.
3634	10 20 15	H. H. Sheldon and C. W. Kernhaw	Gem Canon and spring	Mining	App 5 4 16	3	P.B.U.
3644	10 30 15	Railroad Valley Land & Water Co.	Underground water	Irrigation	Den 4 10 19		Can
3673	11 4 15	Chas. Pike	Baldwin Canon	Irrigation	App 4 11 16	1.6	Can
3682	11 6 15	Sylvain Siard	Coyote Springs	Irrigation	App 8 3 16	0.8	Cert

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STATUS OF APPLICATIONS—Continued

Serial No.	Date of filing	Applicant	Source	Purpose, including domestic	Action on application	Amount allowed	Status of permit
3936	4 26 16	L. J. Richard	Unnamed spring	Irrigation	App 10 14 16	0.2	P.B.U.
3941	4 27 16	Frank R. Donohue	Camp Valley Creek	Irrigation	App 6 17 17	0.2	P.B.U.
3968	5 10 16	John E. Nay, Geo. P. Rogers, John M. Reynolds, and W. J. Womack	Willow Creek	Irrigation	App 11 4 16	11.6	Can
3969	5 11 16	Albert C. Marriott	Rock Springs	Stock	App 3 17 17	0.025	P.B.U.
3971	5 15 16	Chas. W. Young	Plute Creek	Irrigation	App 9 20 16	0.8	P.B.U.
3973	5 15 16	R. A. Yelland	Mud Springs Nos. 1, 2, and 3	Stock	App 10 27 17	0.025	P.B.U.
3986	5 15 16	Frank Ranch & Cattle Company	Jack Spring	Stock	App 11 6 17	0.025	Can
3988	5 15 16	Frank Ranch & Cattle Company	Marble Fall Spring	Stock	Den 2 17 20		
3993	5 22 16	Beatrix E. Andrae	Mitch Creek	Irrigation	App 2 23 17	3.2	Can
3997	5 26 16	Samuel T. Wines	Overland or Indian Creek	Irrigation	App 5 10 17	1.2	P.B.U.
4001	5 31 16	G. H. McCormick	Pole Canon Creek	Milling	App 11 20 16	1	Can
4011	6 10 16	Oasis Land Co.	Underground water	Irrigation	Den 3 22 20		
4017	6 16 16	Ike Springer	St. Clair Canyon	Irrigation	App 12 13 16	0.8	P.B.U.
4023	6 19 16	L. L. Redden	Log Canyon Creek	Irrigation	App 11 15 16	1.6	Can
4024	6 19 16	Pete Lambert, et al.	Granite Canon	Stock	App 12 13 16	0.09	P.B.U.
4025	6 19 16	W. H. Berg	Three unnamed springs	Domestic	App 11 15 16	0.027	Cert
4031	6 23 16	Vineyard Land & Stock Company	Three unnamed springs	Irrigation	App 12 23 16	0.1	P.B.U.
4032	6 23 16	Vineyard Land & Stock Company	Three unnamed springs	Irrigation	App 12 23 16	0.1	P.B.U.
4033	6 23 16	Vineyard Land & Stock Company	Three unnamed springs	Irrigation	App 12 23 16	0.2	P.B.U.
4034	6 26 16	Thos. R. Weber	Weber Springs	Irrigation	App 4 21 17	0.4	P.B.U.
4038	6 28 16	Geo. D. Olson	Olson Creek	Milling	App 12 11 16	1	Can
4047	7 5 16	Rochester Mines Co.	Spring	Mining and milling	App 9 6 17	1	Can
4052	7 8 16	William T. O'Neil	Angel Lake and Creek	Irrigation	Den 11 8 20		
4056	7 11 16	Union Land & Cattle Co.	Ivanhoe Spring	Milling	App 4 2 17	0.5	Can
4058	7 14 16	G. K. Collins	Spring	Irrigation	App 11 30 17	0.8	Can
4061	7 17 16	C. B. Halsey	East Fork Beaver Creek	Irrigation	App 12 23 16	0.4	Can
4063	7 17 16	John Esser	Mud Spring	Stock	App 1 18 17	0.025	P.B.U.
4067	7 21 16	John Esser	Wood Camp Spring	Stock	App 1 18 17	0.025	P.B.U.
4067	7 21 16	H. D. Porter	Mexican Camp Spring	Stock	App 3 9 17	0.025	P.B.U.
4068	8 11 16	Pacific Livestock Co.	High Rock Lake	Irrigation	App 5 9 17	5.824 acre-feet	P.B.U.
4111	8 17 16	Eli Cann	Big Belmaire Creek, Squirel Creek and unnamed stream	Irrigation	App 3 14 17	0.8	Wdn
4112	8 18 16	Kawich Cattle Association	Stonewall Spring	Irrigation	App 3 16 17	0.8	Can
4124	8 25 16	Chas. W. Williams	Upper Davis Spring	Irrigation	App 4 2 17	0.1	Can
4125	8 25 16	Chas. W. Williams	Lower Davis Spring	Irrigation	App 4 2 17	0.18	P.B.U.
4126	8 25 16	Chas. W. Williams	Kinkad Spring	Irrigation	App 4 2 17	0.07	P.B.U.
4127	8 25 16	Chas. W. Williams	No. 4 Spring	Stock	App 4 2 17	0.07	P.B.U.
4128	8 25 16	Chas. W. Williams	Cockalorum Spring	Irrigation	App 4 2 17	0.06	P.B.U.
4131	8 28 16	Ambro Rosaschi	Cottonwood Creek	Stock	App 4 20 17	0.022	P.B.U.
4137	8 30 16	John Papesh	Schedelte Spring	Irrigation	App 5 7 17	0.25	Wdn
4138	8 30 16	O. O. Tognoni	Mountain Spring	Stock	App 11 27 17	0.025	P.B.U.
4146	9 12 16	A. L. Dornberger	Altuna Spring	Mining	App 1 16 17	0.025	Can
4156	9 20 16	G. H. McCormick, F. O. Palmer, E. Stank	Tungsten Spring	Milling	App 1 15 17	0.06	Can
4157	9 20 16	G. H. McCormick, F. O. Palmer, E. Stank	Schedelte Spring	Milling	App 1 15 17	0.1	Can

4161	9 22 16	Flora Dean Hobart	Willow Spring	Irrigation	App	3 15 17	0.6	P. B. U.
4162	9 23 16	Eva Phipps	Bruneau River	Irrigation	App	4 24 17	1.6	Can
4163	9 23 16	Joseph Oxborrow	Oxborrow Spring	Irrigation	App	2 8 17	0.5	Cert
4170	9 28 16	S. B. Nay	Deer Creek Spring	Stock	App	4 5 17	0.5	P. B. U.
4171	10 2 16	Lee R. Marriott	Dayton Spring	Stock	App	3 21 17	0.025	P. B. U.
4172	10 3 16	L. P. Kimball	Stager's Well or Gray's Sp.	Stock	App	3 10 17	0.025	P. B. U.
4173	10 10 16	Lay Bros.	Bliss Canyon and spring	Irrigation	App	3 15 17	0.8	P. B. U.
4179	10 20 16	John S. Winter	Winter Spring	Irrigation	App	3 15 17	0.025	Can
4180	10 20 16	Thomas Lorenz	Limerick Canyon	Irrigation	App	3 14 17	0.025	P. B. U.
4203	10 30 16	Geo. F. Baker	Lime Creek	Irrigation	App	4 5 17	0.6	P. B. U.
4204	10 24 16	Wm. G. Lamb	Elderberry Spring	Stock	App	7 14 17	0.025	Can
4213	11 11 16	Success Con. M. & M. Co.	Ronanza Creek	Power and milling	App	4 25 17	0.025	P. B. U.
4214	11 13 16	Chas. H. Taylor	Wild Horse Corral Spring	Stock	App	4 5 17	0.025	Can
4215	11 13 16	Chas. H. Taylor	Blue Jay Spring	Stock	App	4 25 17	0.025	Can
4216	11 18 16	Ell Cann	Unnamed spring (3)	Irrigation	App	5 8 17	1.6	Can
4223	12 1 16	Chas. Dimmick	Willow Spring	Stock	App	3 20 17	0.025	P. B. U.
4233	12 1 16	Chas. Dimmick	Bluff Spring	Stock	App	7 27 17	0.025	P. B. U.
4234	12 1 16	Chas. Dimmick	Crow Spring	Stock	App	3 20 17	0.025	P. B. U.
4235	12 1 16	Chas. Dimmick	Leadville Spring	Stock	App	3 19 17	0.025	P. B. U.
4236	12 1 16	O. C. Houghton	Al Spring	Stock	App	3 19 17	0.025	P. B. U.
4241	12 5 16	Domingo Huilde	Butte Spring	Stock	App	7 24 17	0.1	Cert
4242	12 5 16	William E. Shirley	Sunbelt Spring	Stock	App	3 19 17	0.02	Can
4247	12 13 16	Geo. Baker	Slate Creek	Irrigation	App	3 20 17	0.4	Can
4254	12 20 16	Edward J. Schaefer	Six Spring	Irrigation and stock	App	5 10 17	0.3774	Can
4257	12 21 16	Legitimate Mines Co.	Bourne Creek	Irrigation	App	9 4 17	1	Can
4262	12 27 16	L. M. Wood, O. E. Hamblin.	East Spring	Irrigation	App	3 9 17	0.135	Can
4267	12 27 16	R. B. Stewart	Dry Creek	Irrigation	App	4 4 17	0.48	Can
4270	1 2 17	Oretime L. Lay	Willard Creek	Irrigation	App	8 28 19	3.4	P. B. U.
4291	2 2 17	John W. Tuck	Stanley "B" Spring	Mining	App	9 15 17	2	Can
4303	2 10 17	Humboldt County	Wright's Creek	Municipal	App	4 5 19		Chg. Div.
4304	2 10 17	Humboldt County	East Horse Canyon	Municipal	App	4 5 19		Chg. Div.
4305	2 10 17	Humboldt County	Sacramento Canyon	Municipal	App	4 5 19		Chg. Div.
4306	2 10 17	Humboldt County	Little Rocky Canyon	Municipal	App	4 5 19		Chg. Div.
4307	2 10 17	Leach Bros.	Ferguson Spring	Irrigation	App	9 12 17	0.1	P. B. U.
4308	2 17 17	Chris Dalestrom	Brickyard Spring	Stock	App	6 27 17	0.025	P. B. U.
4319	2 17 17	Plymouth L. & S. Co.	Mitchell Spring	Stock	App	7 2 17	0.5	P. B. U.
4324	2 20 17	Adams-McGill Co.	Douglas Spring	Stock	App	10 5 17	1	Can
4326	2 23 17	W. G. Adamson	Eldorado Canyon	Power and mining	App	5 16 18	1	Can
4333	3 1 17	Joseph P. Martin	Martin Spring	Mining and milling	App	10 22 17	0.025	P. B. U.
4334	3 1 17	Ida H. Miller et al.	Crecent Valley Wash	Stock	App	7 26 17	20	Can
4336	3 1 17	J. D. Meyer et al.	Big Smoky Creek	Power	App	10 22 17	3.2	Can
4342	3 3 17	W. M. DeLong	Humboldt Creek	Irrigation	App	5 19 19	3.2	Can
4346	3 7 17	Mrs. Eliza A. Page	Deer Creek	Stock	App	10 16 17	0.025	P. B. U.
4351	3 10 17	F. F. Franke	Iron Spring	Irrigation	App	7 26 17	1	Can
4354	3 19 17	Vineyard L. & S. Co.	Freeman Creek	Irrigation	App	12 10 17	0.025	P. B. U.
4366	3 19 17	H. D. Porter	Unnamed Spring	Stock	App	10 16 17	0.06	P. B. U.
4372	3 24 17	Rochester Combined Mines Co.	McDonald Spring	Irrigation	App	7 12 17	1	P. B. U.
4383	4 4 17	Rochester Combined Mines Co.	Tunnel	Mining	App	3 1 18	1	P. B. U.
4384	4 4 17	Rochester Combined Mines Co.	Spring	Mining and milling	App	3 1 18	1	P. B. U.
4385	4 4 17	Rochester Combined Mines Co.	Spring	Mining and milling	App	3 1 18	1	P. B. U.

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Serial No.	Date of filing	Applicant	Source	Purpose, including domestic	Action on application	Amount allowed	Status of permit
4386	4 4 17	Zeb Silve, et al.	Ward Spring	Mining and milling	App 10 22 17	1	Can
4392	4 11 17	Jacob B. Humphrey	Pine Creek	Irrigation	App 9 25 17	0.025	P.B.U.
4393	4 11 17	Wm. S. Lamb, et al.	Lamb Spring	Stock	App 10 22 17	0.025	P.B.U.
4394	4 12 17	Baker Livestock Co.	Lehman Creek	Power	App 10 26 17	18	Can
4395	4 13 17	Allen W. Wakeling, et al.	Summit Spring	Stock	App 10 22 17	0.025	Can
4398	4 17 17	Minnie F. Tuck	Chipmunk Spring	Mining	App 9 15 17	2	Can
4400	4 18 17	Antelope Valley L. & C. Co.	Unnamed creek	Irrigation	App 3 1 18	2	Can
4401	4 18 17	Geo. T. Smith	Young Canon Creek	Irrigation	App 2 1 18	0.4	Can
4403	4 21 17	Rocheater Combined Mines Co.	Black Knob Spring	Mining	App 2 14 18	1	Can
4404	4 23 17	Tom McCormack, et al.	LaQuinta Spring	Mining	Den 4 30 19		
4405	4 23 17	Tom McCormack, et al.	Indian Spring	Mining	Den 4 30 19		
4406	4 23 17	Tom McCormack, et al.	Willow Spring	Mining	Den 4 30 19		
4412	4 27 17	Carl F. Muir	Spring	Mining	App 10 22 17		
4415	4 28 17	Baker Livestock Co.	Baker Creek	Power	App 10 22 17	0.02	P.B.U.
4416	4 30 17	Pete Eders	Poison Canon	Stock	App 10 26 17	18	Can
4417	4 30 17	Pete Eders	Dry Canon Spring	Stock	App 1 5 18	0.025	P.B.U.
4423	5 4 17	Frank McBride	Consolidated Spring	Irrigation	App 10 16 17	0.025	P.B.U.
4424	5 4 17	John Etchebarren	Young Canon	Irrigation	App 1 21 19	1.2	Can
4426	5 5 17	Chango & Aldax	Buckeye Creek	Stock	App 10 22 17	0.025	Can
4428	5 9 17	John Ellisondoberry	Ellisondoberry Spring	Stock	App 10 22 17	0.025	Can
4430	5 14 17	Abram Cohn	Cohn Lake	Irrigation	App 1 5 18	1.6	Can
4431	5 14 17	John T. Blake	Iowa Canon	Irrigation	App 10 30 17	1.920 acre-feet	Can
4432	5 14 17	Martin Etchmenny	Pritchard Canon	Irrigation	App 11 27 17	0.15	Can
4433	5 14 17	Oasis Land Co.	Pahrump Valley Creek	Irrigation	Den 8 22 20		
4434	5 16 17	Gaston Uhalde	Moritz Nager Creek	Stock	App 11 13 17	0.025	P.B.U.
4435	5 16 17	Gaston Uhalde	Sheep Springs	Stock	App 11 13 17	0.025	P.B.U.
4436	5 16 17	Gaston Uhalde	South Regli Springs	Stock	App 11 13 17	0.025	P.B.U.
4452	5 28 17	H. F. Dangberg Land & Livestock Co.	Wild Horse Springs	Stock	App 12 10 17	0.025	P.B.U.
4453	5 28 17	H. F. Dangberg Land & Livestock Co.	Titus Spring	Stock	App 12 10 17	0.025	P.B.U.
4455	5 29 17	Edward P. Graham	Timber of Pole Creek	Irrigation	App 8 8 19	1.6	Can
4457	6 1 17	S. B. Bieroth	McDonald Creek	Irrigation	App 10 23 17	0.2	Can
4458	6 1 17	W. H. Berg	Granite Canon	Milling	App 9 27 17	0.06	Can
4460	6 7 17	Elliot Snow	Condor Canon	Irrigation	App 10 10 17	0.4	P.B.U.
4462	6 8 17	Jay Henrie and Geo. Thirlot.	Delamar Flat Reservoir	Irrigation	App 12 12 17	0.025	P.B.U.
4464	6 11 17	Eli Cann	Big Belmaire Creek, Squirrel Creek, and unnamed creek	Stock			
4471	6 16 17	Geo. C. Baldwin	Big Spring	Irrigation	App 9 23 17	0.8	Can
4475	6 26 17	Bur Welch	Brier Springs	Irrigation	Den 4 9 20		
4476	6 26 17	Domingo Recatune	Summit Springs	Irrigation	App 10 16 17	0.4	P.B.U.
4477	6 26 17	Domingo Recatune	Summit Springs	Stock	Den 12 23 19		
4478	6 26 17	Pete Arena Co.	Wittken Springs	Stock	Den 12 23 19		
4484	6 28 17	M. Countis	Spanish Canon	Irrigation	App 10 23 17	0.5	P.B.U.
4488	7 3 17	G. W. Caviness	Timber Canon Creek	Irrigation	App 12 12 17	1	Can
4490	7 5 17	Fritz Elges	Sheep Canon Springs	Irrigation	App 12 4 18	1	Can
4491	7 7 17	Pyramid L. & S. Co.	Elges Spring	Stock	App 2 15 18	0.025	Can
			Anderson Creek	Irrigation	App 12 12 17	1.6	Wdn

4492	M. Eyerhalde	7 7 17	Jim Creek, etc.	Irrigation	Den 2 17 20	
4493	Thos. Dickson	7 7 17	Tunnel	Stock	Den 11 14 19	
4494	Clyde G. Sevier	7 7 17	Holy Lake and Holy Lake Cr.	Irrigation	App 12 10 17	0.8
4501	T. H. Chatom & J. J. Vignolo	7 11 17	Cordwood Spring	Stock	App 4 9 18	0.025
4506	T. H. Chatom & J. J. Vignolo	7 11 17	Black Rock Spring	Stock	App 4 9 18	0.025
4512	J. C. Tognoni	7 14 17	Black Rock Spring	Domestic	App 6 1 18	0.025
4520	Craven Copper Co.	7 21 17	Unnamed spring	Mining	App 12 7 17	1
4525	Mrs. Margaret Delaney	7 26 17	Steel Spring	Stock	Den 12 23 19	
4527	Bernardo Damele	7 26 17	Basin Spring	Stock	App 12 10 17	0.025
4528	Bernardo Damele	7 26 17	West Cottonwood Spring	Stock	App 12 10 17	0.025
4529	Bernardo Damele	7 26 17	Spring	Stock	App 12 10 17	0.025
4537	H. F. Dangberg Land & Livestock Co.	8 1 17	Spanish Springs	Stock	App 7 22 18	0.025
4538	Malcolm Armstrong	8 10 17	Bullion Canyon	Mining	App 9 17 18	1
4540	Frank A. Austin	8 16 17	Shirt Tail Canyon	Irrigation	App 12 1 19	0.8
4541	Christian P. Ronnow and Philip Mathews	8 16 17	Hamble Canyon	Irrigation	App 8 6 19	400 acre-feet
4543	Onedine L. Lay	8 16 17	Hamble Canyon	Irrigation	App 12 26 17	0.5857
4546	Chas. E. Kent	8 20 17	Mad Hole Springs	Stock	App 10 28 19	0.025
4547	Dominick E. Quilici	8 20 17	Willow Creek	Irrigation	Wdn 10 24 19	
4549	Western Pacific R. R.	8 23 17	Crystal Spring	Irrigation	App 4 22 18	0.2
4552	Utah Construction Co.	8 23 17	Horse Creek Canyon	Transportation	App 2 1 18	0.1
4553	Utah Construction Co.	8 23 17	Long Canon Spring	Stock	App 1 4 18	0.025
4554	Utah Construction Co.	8 23 17	Unnamed spring	Stock	App 1 4 18	0.025
4555	Utah Construction Co.	8 23 17	Unnamed spring	Stock	App 1 8 18	0.025
4556	Utah Construction Co.	8 23 17	Unnamed spring	Stock	App 1 8 18	0.025
4557	Utah Construction Co.	8 23 17	Sam Baker Spring	Stock	App 1 8 18	0.025
4558	Utah Construction Co.	8 23 17	Unnamed spring	Stock	App 1 8 18	0.025
4559	Utah Construction Co.	8 23 17	Unnamed spring	Stock	App 1 2 18	0.025
4561	Utah Construction Co.	8 23 17	Spring	Stock	App 1 2 18	0.025
4562	Utah Construction Co.	8 23 17	Spring	Stock	App 1 2 18	0.025
4563	Greenberry Welch	8 24 17	Pine Creek	Stock	App 1 2 18	0.025
4567	Gil Prida	8 24 17	Unnamed spring	Irrigation	App 3 15 20	0.2
4573	Martin Etchmendeny	9 10 17	Stonehouse Creek	Stock	App 2 1 18	0.025
4576	Fritz Elges	9 12 17	Spring	Irrigation	App 8 15 18	60 acre-feet
4576	Fritz Elges	9 12 17	North Foothill Spring	Stock	App 2 15 18	0.025
4577	Fritz Elges	9 12 17	Point of Hill Spring	Stock	App 2 15 18	0.025
4578	Fritz Elges	9 12 17	Tree Spring	Stock	App 2 15 18	0.025
4584	Francisco Sgarini	9 13 17	Maver Canyon Spring	Stock	App 2 15 18	0.025
4591	John Harrison	9 14 17	Humboldt River	Stock	Den 12 23 19	
4592	Eureka Land & Stock Co.	9 14 17	Underground waters	Irrigation	App 4 11 19	6.4
4593	Geo. T. Wright	9 15 17	Underground waters	Stock	App 3 26 18	0.025
4594	Raymond Stewart, et al.	9 17 17	Summit River	Milling	App 12 31 17	0.2
4596	Julia May Knox, et al.	9 17 17	Muddy River	Stock	App 12 9 18	0.025
4597	J. P. Aldaz	9 17 17	Lyman Canon Springs	Irrigation	Den 12 1 20	
4599	Geo. Doyle	9 19 17	Woodman Canon Springs	Irrigation	App 4 25 18	0.14
4601	Muncy Creek Mining Co.	9 24 17	Muncy Creek	Mining	App 8 1 19	1
4602	L. H. Taylor	9 25 17	Spring Creek	Irrigation	App 8 2 19	1.6
4603	Peter Buol	9 26 17	Cold Spring	Power	Wdn 12 5 18	
4604	Fritz Cordes	9 26 17	W. Fk. Carson River	Irrigation	App 12 14 18	1.6
4605	Fritz Cordes	9 26 17	W. Fk. Carson River	Irrigation	App 1 23 19	0.83
4606	Fritz Cordes	9 26 17	Coal Valley Dam No. 2	Irrigation	App 1 22 19	
4609	L. M. McArthur	9 28 17	Coal Valley Dam No. 2	Stock	App 9 17 19	0.025

STATUS OF APPLICATIONS—Continued

Serial No.	Date of filing	Applicant	Source	Purpose, including domestic	Action on application	Amount allowed	Status of permit
4610	9 28 17	L. M. McArthur	Willow Spring	Stock	App 9 17 19	0.025	Can
4611	9 28 17	L. M. McArthur	White River Drainage Dam	Irrigation	App 9 17 18	0.025	P.B.U.
4613	10 1 17	L. M. McArthur	Underwood Canon	Stock	App 2 25 19		
4616	10 5 17	Thos. Brackney	Granger Spring No. 1	Stock	App 12 28 18	0.025	Can
4617	10 5 17	Wm. Culverwell, et al.	West Oak Spring	Stock	App 12 2 18	0.025	Can
4619	10 5 17	Hans Olson, et al.	Granger Spring No. 2	Stock	App 12 20 18	0.025	Can
4620	10 8 17	Wm. Culverwell, et al.	Bruno Spring	Stock	App 12 21 18	0.025	P.B.U.
4621	10 8 17	James Ryan	Moore Spring	Stock	App 12 21 18	0.025	P.B.U.
4622	10 8 17	James Ryan	Bird Spring	Stock	App 12 21 18	0.025	Can
4623	10 18 17	James Ryan	Quail Spring	Stock	App 12 6 18	0.025	P.B.U.
4624	10 13 17	J. H. Conway and J. L. Jones	Twin Spring	Stock	App 12 8 18	0.025	Can
4625	10 13 17	Wm. Lamb	Cedar Well	Stock	App 8 2 18	0.025	P.B.U.
4626	10 15 17	Plymouth Land & Stock Co.	Fedans Spring	Stock	App 3 26 18	0.06	Can
4637	10 16 17	United Cattle & Packing Co.	Unnamed spring	Mining	App 5 24 18	0.25	P.B.U.
4639	10 16 17	B. B. Shepard	Dutch Creek	Irrigation	App 4 25 18	0.4	Can
4640	10 16 17	M. Edlams	Lamb's Spring	Stock	App 2 3 19	0.025	P.B.U.
4645	10 18 17	Henry & Thriot	Quaking Asp Spring	Stock	App 4 3 18	0.025	P.B.U.
4649	10 22 17	Clay Springs Cattle Co.	Trough Spring	Stock	App 4 8 18	0.025	P.B.U.
4650	10 23 17	Clay Springs Cattle Co.	Dale Spring	Stock	App 12 16 18	0.025	P.B.U.
4651	10 23 17	Clay Springs Cattle Co.	Johns Spring	Stock	App 4 8 18	0.025	P.B.U.
4652	10 23 17	Clay Springs Cattle Co.	Willow Spring	Stock	App 2 13 19	0.06	P.B.U.
4653	10 23 17	Clay Springs Cattle Co.	Antone Pass Spring	Irrigation	App 3 26 18	0.025	P.B.U.
4654	10 23 17	Clay Springs Cattle Co.	Rabbit Creek Spring	Stock	App 3 26 18	0.025	P.B.U.
4655	10 23 17	Clay Springs Cattle Co.	West Side Spring	Stock	App 4 13 18	0.025	P.B.U.
4657	10 24 17	Steptoe Livestock Co.	Lewis Spring	Stock	App 3 26 18	0.025	P.B.U.
4658	10 24 17	Steptoe Livestock Co.	Gooseberry Creek	Stock	Wdn 7 24 19		
4659	10 24 17	Steptoe Livestock Co.	Oreana Spring	Irrigation	Wdn 9 29 19		
4660	10 24 17	Vineyard Land & Stock Co.	Weepah Spring	Stock	App 12 14 18	0.025	P.B.U.
4661	10 26 17	United Cattle & Packing Co.	Willow Spring	Stock	Den 9 9 19		
4662	11 1 17	J. Castles, et al.	Cow Holes Spring	Stock	App 12 6 18	0.025	Can
4663	11 1 17	J. Castles, et al.	Willow Spring	Stock	Den 5 19 19		
4667	11 1 17	J. Castles, et al.	Willow Spring	Stock	App 12 6 18	0.025	Can
4668	11 1 17	Ence & Willis	Willow Spring	Stock	App 12 6 18	0.025	Can
4669	11 1 17	Ence & Willis	Willow Spring	Stock	App 12 6 18	0.025	Can
4670	11 1 17	Ence & Willis	Willow Spring	Stock	App 12 6 18	0.025	Can
4671	11 1 17	Ence & Willis	Willow Spring	Stock	App 12 6 18	0.025	Can
4672	11 1 17	Ence & Willis	Willow Spring	Stock	App 12 6 18	0.025	Can
4673	11 5 17	Fritz Elges	Graham Spring	Stock	Den 6 6 20		
4674	11 5 17	Fritz Elges	Marah's Spring	Mining	App 4 18 18	0.25	P.B.U.
4679	11 6 17	Nevada Standard Copper Co.	Wild Cat Spring	Stock	App 12 8 19		
4680	11 7 17	Fritz Elges	Homestead Well	Irrigation	App 12 30 18	0.8	Can
4681	11 7 17	L. P. Kimball and John Delfs	Italian Spring	Stock	App 1 10 19		
4689	11 9 17	Tob Connors and J. E. May	Thorley's Well	Stock	App 12 6 18	1.6	P.B.U.
4692	11 10 17	Thos. A. Thorley	China Well	Stock	App 12 6 18	0.025	Can
4694	11 12 17	J. A. Conaway	Canon Spring No. 2	Stock	App 12 21 18	0.025	P.B.U.
4696	11 12 17	J. Ryan, et al.	Lower Canon Spring	Stock	App 12 21 18	0.025	Can
4698	11 12 17	J. Ryan, et al.	Lower Canon Spring	Stock	App 12 21 18	0.025	Can

11	12	17	J. Ryan, et al.	Red Rock No. 2	Stock	App 12 21 18	Can
11	15	17	Nick Ratio	Water Canon Spring	Stock	App 12 30 18	Cert
11	15	17	Nick Ratio	Head Springs Mining Cqn.	Stock	App 12 30 18	Cert
11	17	17	E. W. G. Davis, et al.	Sheep Spring	Stock	Den 6 19 19	P.B.U.
11	17	17	J. W. Richard and W. F. Thorne	Cart Spring	Stock	App 12 21 18	
11	19	17	Fritz Elges	Crater Spring	Stock	App 1 21 19	
11	19	17	Fritz Elges	Trull Spring	Stock	App 1 21 19	
11	19	17	Fritz Elges	Yellow Spring	Stock	App 12 14 18	
11	19	17	E. L. Sharp, et al.	Brightam's Well	Stock	App 12 14 18	Can
11	19	17	E. L. Gregory	Box Canon Spring	Stock	Den 6 21 18	P.B.U.
11	19	17	J. W. Richards and W. F. Thorne	Holly Spring	Stock	App 12 14 18	P.B.U.
11	19	17	J. N. Castles and J. T. Wright	Henrie Spring	Stock	App 12 14 18	P.B.U.
11	19	17	C. N. Castles and J. T. Wright	Little Ck Spring	Stock	App 12 14 18	P.B.U.
11	19	17	James Castles, et al.	Murphy Gap	Stock	App 12 14 18	P.B.U.
11	19	17	James Castles, et al.	Wild Spring	Stock	App 12 9 18	Can
11	19	17	James Castles, et al.	Box Canon Spring	Stock	App 12 8 18	P.B.U.
11	19	17	Warren Cutler and Wm. Higbee	Unnamed spring	Stock	App 4 10 19	P.B.U.
11	19	17	Warren Cutler and Wm. Higbee	Brinkhoff Spring	Stock	App 12 14 18	Can
11	20	17	Gill Prida	Unnamed spring	Stock	App 12 6 18	Cert
11	20	17	Gill Prida	Crescent Valley Reservoir	Stock	Den 4 8 19	P.B.U.
11	21	17	J. L. Sharp	Fox Tail Spring	Stock	Den 5 19 19	
11	21	17	J. A. Gandola	Basin Spring	Stock	Den 4 19 19	
11	22	17	W. T. Stewart, Jr.	Walker River	Irrigation	Den 4 1 20	
11	22	17	Omer Stewart	Willow Spring	Stock	Den 7 26 19	
11	22	17	Omer Stewart	Gulch Spring	Stock	Den 7 26 19	
11	24	17	John B. Gallagher	Side Hill Spring	Stock	Den 7 26 19	
11	26	17	J. F. Foremaster	Burrow Springs	Stock	Den 5 19 19	
11	26	17	J. F. Foremaster	Liberty Springs No. 3	Mining	Den 5 19 19	
11	26	17	J. F. Foremaster	Liberty Spring No. 4	Mining	Den 5 19 19	
11	26	17	Liberty Gold Mines	Liberty Spring	Stock	App 7 8 19	P.B.U.
11	26	17	Liberty Gold Mines	Tule Spring	Stock	App 7 8 19	P.B.U.
11	26	17	W. U. Schofield, et al.	Springs	Domestic	App 7 8 19	P.B.U.
11	27	17	Joanna Cronin	Black Horse Well	Stock	App 12 14 18	Can
11	27	17	Wm. G. Lamb, et al.	Muddy River	Irrigation	Den 12 1 20	
11	3	17	Moapa & Salt Lake Produce Co.	Storey Spring	Stock	App 6 14 19	P.B.U.
11	4	17	Plymouth Land & Stock Co.	Wood Canon	Stock	App 2 25 19	P.B.U.
11	5	17	Thos. Brackney	Cold Spring	Irrigation	App 3 26 18	Cert
11	5	17	Thos. Brackney	Gold Spring	Stock	App 12 14 18	P.B.U.
11	8	17	Paris F. Johnson	Quinn River	Irrigation	App 4 30 19	
11	8	17	Eureka Land & Stock Co.	East Fork Walker River	Irrigation	Den 11 24 19	P.B.U.
11	10	17	Albert T. Lay, et al.	Unnamed spring	Stock	App 10 17 18	P.B.U.
11	12	17	C. H. Masterson	Mud Spring	Stock	App 2 29 20	Cert
11	12	17	Hotel Nevada Min. Co.	Buster Spring	Stock	App 2 8 19	P.B.U.
11	12	17	John F. Klarer	Liberty Spring No. 5	Mining	Den 5 19 19	P.B.U.
11	13	17	Dennis Cowle	Spanish Spring	Irrigation	App 5 29 18	Cert
11	13	17	Liberty Gold Mines	Mosquito Creek	Irrigation	App 2 13 19	P.B.U.
11	13	17	United Cattle & Packing Co.	Mosquito Creek	Irrigation	App 2 13 19	P.B.U.
11	17	17	Essie Scuff	Reserve Spring	Stock	Den 7 26 19	P.B.U.
11	17	17	J. F. Foremaster	Springs 6, 7, 8	Stock	App 1 21 19	P.B.U.
11	17	17	Wm. A. Moore	Davis Spring	Stock	App 1 21 19	P.B.U.
11	17	17	Fritz Elges		Stock	App 1 21 19	P.B.U.

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Serial No.	Date of filing	Applicant	Source	Purpose, including domestic	Action on application	Amount allowed	Status of permit
4792	12 18 17	Fritz Elkes	Canon Spring	Stock	App 1 21 19	0.025	
4793	12 19 17	E. A. Hicks	Quartz Spring	Stock	Den 5 19 19		P.B.U.
4794	12 19 17	Emil Baumann	Antelope Creek	Stock	App 5 18 18	0.5	Can
4795	12 22 17	Carl Ray	Unnamed spring	Irrigation	App 8 6 19	0.025	
4801	12 27 17	Alek Mice	Pine Creek	Irrigation	App 8 6 19	1.8	Can
4806	12 28 17	Cynthia Hines	Unnamed spring	Irrigation	App 5 14 18	2.8	
4810	1 2 18	Mary L. Baum and A. L. DeLong	Leonard Creek	Irrigation	App 10 28 19	4.6	
4818	1 4 18	Victor B. Gardner	Forest Home Creek	Irrigation	App 2 10 19	3.9	P.B.U.
4819	1 4 18	Victor B. Gardner	Trouth Springs	Irrigation	App 3 10 19	0.025	
4821	1 5 18	D. L. Stewart	April Pool Spring	Stock	App 5 19 19		
4822	1 5 18	D. L. Stewart	Three Tackapoo	Stock	Den 5 19 19		
4827	1 7 18	Bert Nay and J. L. Hancock	Grapevine Spring	Stock	App 8 17 18	0.025	P.B.U.
4830	1 9 18	Harry Donoh	Chinualter Spring	Mining	App 6 4 20	0.2	
4831	1 9 18	John A. Moss	Smith Plains Springs No. 1	Irrigation	App 11 19 18	0.2	P.B.U.
4832	1 9 18	John A. Moss	Smith Plains Springs No. 2	Irrigation	App 11 19 18	0.2	P.B.U.
4834	1 9 18	Kawich Cattle Co.	Alkali Spring	Stock	App 10 17 18	0.01	Wdn
4835	1 9 18	Kawich Cattle Co.	Alkali Spring	Stock	App 10 17 18	0.025	Wdn
4836	1 11 18	Virgil Esquale, et al.	Puffer Creek Spring	Irrigation	App 4 28 19	0.2	Cert
4842	1 18 18	Sylvan Shad	Home Creek Spring	Irrigation	App 12 28 18	0.025	P.B.U.
4850	1 18 18	Sharp Land & Cattle Co.	Modes Hole	Stock	App 1 22 19	0.025	P.B.U.
4851	1 23 18	John Gilbarne	Eden Creek	Stock	App 1 22 19	1.2	
4852	1 23 18	Sharp Land & Cattle Co.	Sharp Springs	Stock	App 1 22 19	1.6	P.B.U.
4856	1 25 18	Alexander K. Ishmuel	Pete Rogers Spring	Irrigation	App 1 20 19	3.2	Can
4857	1 25 18	F. S. Munson	Current and Duckwater Cks.	Stock	Den 5 19 19		
4858	1 25 18	Frank A. Gibeaut, et al.	Soap Spring	Stock	Den 5 19 19		
4859	1 25 18	Frank A. Gibeaut, et al.	Tub Basin Spring	Stock	App 12 28 18	0.025	P.B.U.
4859	1 22 18	Sharp Land & Cattle Co.	Little Davis Springs	Stock	App 12 28 18	0.025	P.B.U.
4860	1 22 18	Sharp Land & Cattle Co.	Unnamed spring	Stock	App 1 21 19	9.25	
4871	1 26 18	Union L. & C. Co.	Taylor Creek	Irrigation	App 2 19 19	0.025	Can
4872	1 26 18	J. F. Foremaster, et al.	Triangle No. 2	Stock	App 5 19 19	0.025	
4873	1 26 18	Bert Sanders	Unnamed spring	Irrigation	Den 5 19 19		
4876	1 26 18	Ros. L. Donon	Gleason Spring	Stock	App 12 28 18	0.025	Can
4877	1 31 18	Mrs. L. N. Garrison	Unnamed spring	Irrigation	App 3 29 20	1.2	
4880	1 31 18	John Bradford	Spring	Mining	App 11 18 18	1.2	Can
4883	1 31 18	John Bradford	Unnamed spring	Mining	App 11 18 18	0.5	Can
4884	2 1 18	C. V. Turner	Unnamed spring	Irrigation	App 9 17 19	1.6	Can
4885	2 1 18	Joe Nye	Meadow Creek	Irrigation	App 1 7 20	1.6	
4888	2 4 18	John W. Clarke	French Boy Canyon	Milling	App 8 28 18	0.025	Cert
4892	2 5 18	T. B. Sawyer	Reep Springs	Stock	App 11 18 18	0.025	P.B.U.
4894	2 7 18	Frank McBride	Big Ditch	Irrigation	App 10 21 18	0.3	P.B.U.
4897	2 11 18	W. L. Blackwell	Pony Springs	Irrigation	App 12 19 19	1.1	Can
4900	2 11 18	L. L. Burt, et al.	Cottonwood Spring No. 2	Stock	App 1 10 19	0.025	Can
4902	2 13 18	L. L. Burt and L. C. Denton	Cottonwood Spring No. 2	Stock	App 1 10 19	0.025	Can
4903	2 13 18	L. L. Burt and L. C. Denton	Cottonwood Spring No. 3	Stock	App 1 10 19	0.025	Can
4904	2 13 18	Vernon Jeffcott	Cottonwood Spring	Stock	App 7 10 19	0.025	Can

4908	2 15 18	J. H. Cornell	Belmont Spring	Irrigation	App	12 18 18	0.2	P.B.U.
4909	2 15 18	F. W. Schmalig	Green Spring	Irrigation	App	6 20 18	0.4	Can
4910	2 16 18	United Cattle & Packing Co.	Silver Bow Canon	Irrigation	App	8 18 18	0.3	
4911	2 18 18	O. C. Houghton	Cottonwood Spring	Stock	App	10 19 18	0.025	Cart
4912	2 18 18	O. C. Houghton	Hine's Spring	Irrigation	App	10 19 18	0.125	Cart
4913	2 18 18	O. C. Houghton	Hine's Spring No. 2	Stock	App	10 19 18	0.125	P.B.U.
4914	2 18 18	O. C. Houghton	Houghton Springs	Stock	App	10 19 18	0.025	P.B.U.
4915	2 18 18	O. C. Houghton	Unquaw Springs	Irrigation	App	10 18 18	0.05	P.B.U.
4916	2 18 18	M. W. Ferguson	Unquaw Creek	Stock	App	11 5 18	0.05	
4917	2 19 18	J. H. Clemens	Walt Well	Stock	App	11 5 18	0.05	
4918	2 19 18	J. H. Clemens	Spunking Well	Stock	App	11 5 18	0.05	
4919	2 19 18	J. H. Clemens	North Well	Stock	App	11 5 18	0.05	
4920	2 19 18	J. H. Clemens	East Well	Stock	App	11 5 18	0.05	
4921	2 19 18	Eldorado Flacstaff Mining & Milling Co.	Water-bearing Basin	Mining	Wdn	5 16 18		
4922	2 20 18	Enos Emmitt	Eldorado Creek	Irrigation	App	8 29 20	1	
4923	2 26 18	Daniels Ditch Co.	E. Walker River	Irrigation	App	2 19 20	15.62	
4924	2 27 18	Gertrude M. Williams	Spring in Potato Canon	Irrigation	App	12 31 18	1.6	Can
4925	3 28 18	Dioniel Redoni	Lower Silver Bow Canon	Irrigation	App	11 20 19	0.4	
4926	3 1 18	Reuben H. Saxton, et al.	Canon River	Irrigation	App	7 8 18	1.6	
4927	3 1 18	Mrs. Cyrus Horn	Baker & Joshua Spring	Irrigation	App	10 1 18	0.2	P.B.U.
4928	3 6 18	Thos. Dolan	Nigger Abe Creek	Irrigation	App	8 6 19	1	
4929	3 7 18	Thos. Dolan	Crystal Spring	Irrigation	App	8 6 19	1	
4930	3 11 18	Wm. E. Beck	Santa Cruz Spring	Stock	App	11 8 18	0.05	P.B.U.
4931	3 11 18	Wm. E. Beck	Wood Canon Spring	Stock	App	11 8 18	0.025	P.B.U.
4932	3 11 18	Wm. E. Beck	Hine's Hot Sulphur Spring	Irrigation	App	11 8 18	0.025	P.B.U.
4933	3 11 18	Marko Celewich	Reindeer Spring	Stock	App	2 3 19	0.4	
4934	3 14 18	Clyde Matthews, Jr.	Iron Tank Spring	Stock	App	7 2 19	0.025	P.B.U.
4935	3 14 18	Chas. Matthews, Jr.	Henderson Creek	Irrigation	App	6 20 19	0.025	Can
4936	3 18 18	Eureka Land & Stock Co.	Big Pole Creek	Irrigation	App	10 1 18		
4937	3 20 18	Albert O. Thatcher	Hig Spring	Irrigation	Wdn	10 7 19		
4938	3 21 18	James Ryan	Crow Spring	Stock	App	8 7 19	0.025	Can
4939	3 21 18	James Ryan	Dana Spring	Stock	App	7 22 19	0.025	P.B.U.
4940	3 21 18	Henry Joseph Schlarman	Floyd Spring	Stock	App	8 7 19	0.025	P.B.U.
4941	3 23 18	Benoit Lohidey, et al.	Meadow Valley Wash	Irrigation	App	6 26 19	0.45	
4942	3 26 18	Joe Beane	Jack Creek	Irrigation	Wdn	1 17 19		
4943	3 26 18	Henry Joseph Schlarman	Underground Waters	Mining	App	12 30 19	1	
4944	3 26 18	Benoit Lohidey, et al.	North Pk. Cottonwood Ck.	Stock	Den	3 21 19		
4945	3 28 18	V. C. Rackliff	Unnamed spring	Irrigation	App	3 30 20	0.5	P.B.U.
4946	3 28 18	Emerson F. Williams	Meadow Valley Wash	Irrigation	Den	11 14 19		
4947	3 28 18	P. A. Simon and F. J. Siebert	Douglas Spring	Mining	App	8 1 18	1	App revoked
4948	3 30 18	Thos. Fisherman	Cottonwood Creek	Irrigation	App	11 4 19	0.179	P.B.U.
4949	4 3 18	W. N. McGill	Unnamed spring	Stock	App	9 10 18	0.025	P.B.U.
4950	4 3 18	Thos. Fisherman	Deer Spring	Stock	App	7 10 19	0.025	
4951	4 5 18	Vernon Jeffcott	Indian Spring	Stock	Den	12 19 19		
4952	4 8 18	Jean Aldax, Pete Chango	Star Canon Spring	Irrigation	App	1 10 19	0.025	P.B.U.
4953	4 11 18	Jean Aldax, Pete Chango	Coyote Springs	Irrigation	Den	5 26 19		
4954	4 11 18	Blanche Siard	Marlette's Spring	Stock	App	12 24 18	0.025	P.B.U.
5001	5002	Martin Etchemendy	French Spring	Stock	App	12 24 18	0.025	P.B.U.
5002	5002	Martin Etchemendy	Rye Patch Spring	Stock	App	10 19 18	0.025	P.B.U.
5003	4 12 18	Martin Etchemendy	Big Canon and Creek	Stock	App	12 19 18	3	
5004	4 12 18	Paul H. Dory	Humboldt River	Irrigation	App	1 21 19		
5005	4 13 18	Elmer J. Isaac	Humboldt River	Irrigation	Wdn	4 25 19		
5006	4 15 18	Thos. Nelson & Co.	Humboldt River	Irrigation	App	4 9 19	1.64	
5007	4 15 18	Peter Decker	Humboldt River	Irrigation	App	4 9 19		

STATUS OF APPLICATIONS—Continued

Serial No.	Date of filing	Applicant	Source	Purpose, including domestic	Action on application	Amount allowed	Status of permit
5008	4 15 18	Mrs. B. L. White	Humboldt River	Irrigation	App 4 9 19	1.6	
5011	4 20 18	Mrs. A. Thorley	Cedar Wash	Stock	App 7 10 19	0.025	
5013	4 22 18	J. W. Richard	Dry Lake Reservoir	Stock	App 7 8 19	10 acre-feet	
5015	4 22 18	Gerlach Livestock Co.	Middle Fk. Cottonwood Cr.	Irrigation	App 4 25 19	2	
5016	4 22 18	Gerlach Livestock Co.	South Fk. Cottonwood Cr.	Irrigation	App 4 25 19	2	
5017	4 22 18	Gerlach Livestock Co.	South Fk. Cottonwood Cr.	Irrigation	App 4 25 19	2	
5020	4 25 18	Henry Hagar	Cash Cabin Spring	Stock	App 6 25 19	0.025	
5023	4 25 18	Henry Hagar	Unnamed spring	Stock	App 7 25 19	0.025	
5024	4 25 18	Henry Hagar	Pony Springs	Stock	App 6 25 19	0.025	
5025	4 25 18	Henry Hagar	Overland Stage Spring	Stock	App 6 25 19	0.025	
5026	4 26 18	P. U. Streib	Unnamed spring	Irrigation	App 2 10 20	0.1	
5028	4 26 18	John Yelland	Four Mile Spring	Irrigation	App 1 20 19	0.15	
5033	4 29 18	Martin Erchemendy	Needle Spring No. 2	Stock	App 12 24 18	0.025	P.B.U.
5034	4 29 18	Martin Erchemendy	Needle Spring No. 1	Stock	App 12 24 18	0.025	P.B.U.
5035	4 29 18	Willow Creek Livestock Co.	Martin Spring	Stock	App 12 24 18	0.025	P.B.U.
5036	4 29 18	Willow Creek Livestock Co.	Rock Spring	Stock	App 12 24 18	0.025	P.B.U.
5037	4 29 18	Willow Creek Livestock Co.	Rock Spring	Stock	App 12 24 18	0.025	P.B.U.
5038	4 29 18	Willow Creek Livestock Co.	Dry Lake Well	Stock	App 12 24 18	0.025	P.B.U.
5039	4 29 18	Willow Creek Livestock Co.	White Rock Spring	Stock	App 12 24 18	0.025	P.B.U.
5040	4 29 18	Willow Creek Livestock Co.	Couge Spring	Stock	App 12 24 18	0.025	P.B.U.
5041	4 29 18	Willow Creek Livestock Co.	Horse Springs	Stock	App 12 24 18	0.025	P.B.U.
5045	5 2 18	Mrs. J. T. Williams, Jr.	Six Mile Canyon	Stock	App 1 4 19	1.6	
5047	5 2 18	The Adams-McGill Co.	James Spring	Irrigation	App 1 4 19	1.6	P.B.U.
5050	5 3 18	E. A. Skillman	Pony Express Spring	Stock	App 12 28 18	0.025	
5056	5 6 18	E. R. Allred	The Four Springs	Irrigation	App 11 10 19	0.8	
5062	5 10 18	Western Pacific R. R. Co.	Spring	Transportation	App 12 17 19	600 acre-feet	Cert
5064	5 11 18	O. C. Houghton	Shilo Spring	Stock	App 10 6 18	0.15	P.B.U.
5065	5 11 18	Fritz Elges	Cedar Spring	Stock	App 12 28 18	0.025	Can
5066	5 11 18	Fritz Elges	Meadow Spring	Stock	App 12 8 19	0.025	Can
5067	5 11 18	Clark Ringling	Bob Reid Creek	Stock	App 12 8 19	0.025	Can
5068	5 11 18	Clark Ringling	Lake Spring Canon Creek	Irrigation	App 1 21 19	0.25	Wdn
5069	5 11 18	Clark Ringling	Grayson Spring	Irrigation	App 1 21 19	0.25	Can
5071	5 13 18	Geyser Land & Cattle Co.	Antelope Spring	Stock	App 12 28 18	0.025	P.B.U.
5072	5 13 18	Geyser Land & Cattle Co.	Burnt Corral	Stock	App 12 28 18	0.025	P.B.U.
5073	5 13 18	Geyser Land & Cattle Co.	Rosebud Spring	Stock	App 5 19 19	0.025	P.B.U.
5076	5 17 18	Anita Cooper	Kyle's Spring	Irrigation	App 4 10 19	0.8	
5078	5 18 18	J. W. Lorge	Reese River	Minning	App 11 19 19	10	
5079	5 18 18	Dick Barrington	Butcher Canon Creek	Irrigation	Wdn 8 9 20		Can
5082	5 23 18	Mary Henney	Mason Creek	Irrigation	App 9 24 18	8.2	
5085	5 24 18	Robert Lee	Intermittent Spring	Irrigation	App 11 18 20	8.2	
5086	5 25 18	Geo. Milch, et al.	Cottonwood Creek	Irrigation	App 7 25 19	0.4	
5087	5 27 18	Gertrude Bruke	Unnamed spring	Irrigation	App 9 17 19	0.2	Can
5089	5 8 18	Richard L. Wood	Unnamed spring	Irrigation	App 6 2 19	0.4	
5090	5 8 18	Dr. C. H. Masterson	East Fork Walker River	Irrigation	Den 11 24 19		
5091	6 4 18	Olympic Mines Co.	Carrigan Spring	Minning	App 11 19 19	0.1	

Year	Owner	Location	Den	17	18	19	Notes
5993	John O'Kennedy	Chiatovich Creek	Den	4	17	19	
5994	Lynn Big Six Mining Co.	Lynn Creek	Den	5	19	19	
5995	United Cattle & Packing Co.	Snow Bird Spring	App	12	28	19	0.1
5996	Everett W. Cavin	Jim Creek	App	6	20	19	1
5997	Ercolina Dotta	West Fork Hot Creek	App	6	14	19	1
5998	Ercolina Dotta	Hot Creek	App	6	14	19	2
5999	Sarah C. Wamboldt	Big Spring	App	11	22	19	0.025
6000	W. F. Dressler	June Spring	App	11	19	19	0.025
6001	Plymouth Land & Stock Co.	Lewis Spring No. 1	App	11	19	19	0.025
6002	Plymouth Land & Stock Co.	Lewis Spring No. 2	App	11	19	19	0.025
6003	Guy W. Rogers, et al.	Drabague waters	Den	4	19	19	4.8
6004	John H. Easer, et al.	Harris Creek	App	2	3	19	
6005	John H. Easer, et al.	Prospect Creek	Den	4	19	19	
6006	W. J. Guthrie	Unnamed springs	Den	11	12	20	
6007	W. J. Guthrie	Coal Creek	App	12	20	19	0.025
6008	Wm. S. Raine	Green Creek	Den	5	21	19	
6009	Wm. S. Raine	Union Valley Creek	Den	8	6	19	
6010	Fernando Golcocheas	Camp Valley Wash	App	12	7	18	0.6
6011	David B. Cluff	Salado Creek	App	1	20	19	0.3
6012	Paul Gerson (Trustee)	Hay Meadow Creek	App	6	25	19	8
6013	Guy E. Baser	Delf's Spring	App	6	25	19	0.2
6014	T. H. Chalmers	South Springs	App	11	19	19	0.025
6015	Alice A. Sallas	McCauley Springs	App	11	19	19	0.025
6016	R. N. Edwards, et al.	Cottonwood Creek	App	12	30	18	0.025
6017	Dr. E. McCafferty	Virgin River	App	1	10	19	0.4
6018	Francis W. Balcomb	Little High Rock	App	12	30	19	0.4
6019	Paul D. Martin	Cottonwood Stream	App	5	19	19	0.025
6020	Earl Huff, et al.	Milton Canyon	App	11	4	19	0.2
6021	John M. Martinez	Rye Patch	App	11	20	19	0.025
6022	Plymouth Land and Livestock Co.	Grabapple Springs	App	8	27	20	0.025
6023	Plymouth Land and Livestock Co.	Road Springs	App	11	20	19	0.025
6024	Plymouth Land and Livestock Co.	Cottonwood Springs	App	11	20	19	0.025
6025	Plymouth Land and Livestock Co.	McKay Springs	App	11	20	19	0.025
6026	Plymouth Land and Livestock Co.	Camp Springs	App	11	20	19	0.025
6027	Plymouth Land and Livestock Co.	Four Posts Springs	App	11	20	19	0.025
6028	Plymouth Land and Livestock Co.	Drop Gate Springs	App	11	20	19	0.025
6029	Plymouth Land and Livestock Co.	Sarvis Berry Springs	App	11	20	19	0.025
6030	Mrs. Avah N. Van Eaton, et al.	Dave Creek	App	7	2	20	7
6031	Clement Maggini	Monroe Spring No. 1	Den	10	28	19	
6032	Union Land & Cattle Co.	Cottonwood Creek	Den	10	28	19	
6033	Charles Dimmick	Tule Desert Reservoir	Wdn	2	15	19	10 acre-foot
6034	Lorenzo D. Creel	Loge Pocket Reservoir	App	7	1	19	10 acre-foot
6035	Manuel Vega	Lime Kiln Canyon	App	7	1	19	0.4
6036	Jake Steiner	Crooked Creek	App	8	15	19	0.8
6037	Jake Steiner	Little Mammoth Springs	App	12	28	18	0.2
6038	T. H. Chalmers, et al.	Delfs Spring	App	12	28	18	0.2
6039			Den	2	2	20	

STATUS OF APPLICATIONS—Continued

Serial No.	Date of filing	Applicant	Source	Purpose, including domestic	Action on application	Amount allowed	Status of permit
5173	7 26 18	T. H. Chatom, et al.	Trapmann Spring	Stock	App 12 14 18	0.025	P.B.U.
5174	7 29 18	A. W. Waukeling	Granite Spring	Stock	App 6 20 19	0.025	P.B.U.
5175	7 29 18	G. R. Saldubehere	Unnamed spring	Stock	App 6 20 19	0.025	P.B.U.
5176	7 29 18	G. R. Saldubehere	Young's Canon	Stock	App 6 20 19	0.025	P.B.U.
5177	7 29 18	O. C. Houghton	Cedar Spring	Stock	App 12 30 19	0.025	
5178	7 29 18	O. C. Houghton	Lower Leadville Springs	Stock	App 12 30 19	0.025	
5180	7 29 18	O. C. Houghton	Upper Leadville Springs	Stock	App 12 30 18	0.025	P.B.U.
5183	7 29 18	John Folwick	Buser Creek	Stock	App 12 23 18	0.025	P.B.U.
5184	7 29 18	Dr. C. H. Masterson	East Fk. Walker River	Irrigation	Den 11 24 19	1	
5185	7 30 18	A. G. Burton	Unnamed spring	Mining	App 7 1 19	0.4	
5187	8 1 18	John B. Pescio	Kingsley Spring	Irrigation	App 7 22 19	0.3	
5190	8 3 18	B. F. Baker, et al.	Little Hot Spring	Stock	App 12 1 19	0.025	
5191	8 3 18	B. F. Baker, et al.	North Hot Spring	Stock	App 12 1 19	0.025	
5192	8 3 18	B. F. Baker, et al.	Shaw's Cabin Spring	Stock	App 12 1 19	0.025	
5193	8 3 18	B. F. Baker, et al.	Shaw's West Spring	Stock	App 12 1 19	0.025	
5195	8 6 18	Sam Hiller	Sage Hen Canon	Irrigation	App 1 3 20	1	
5196	8 6 18	Sam Hiller	Clear Water	Irrigation	Den 10 16 20		
5197	8 6 18	Sam Hiller	Crystal Spring	Stock	Den 10 16 20		
5199	8 10 13	John Uhalde	Cabin Spring	Stock	App 6 23 19	0.025	P.B.U.
5203	8 12 18	Chas. C. Norton	Mountain Spring	Stock	App 1 30 19	0.025	
5204	8 12 18	Chas. C. Norton	Canon Spring	Stock	App 1 30 19	0.025	
5205	8 14 18	A. E. Allen	Humboldt River	Stock	App 4 23 19	1.1	
5206	8 15 18	R. F. Cook	Worling Creek	Irrigation	Den 5 19 19		
5218	8 20 18	Albert O. Thatcher	Big Pole Creek	Irrigation	App 5 20 19	1.6	
5219	8 20 18	Jessie F. Baker	Gold Creek	Irrigation	App 5 20 19	0.6	
5220	8 20 18	Joseph B. Baker	Gold Creek	Irrigation	App 5 20 19	0.85	
5221	8 21 18	Emmett Davis	Cherry Creek	Irrigation	App 11 4 19	1.6	Can
5225	8 23 18	Walter E. Treagaakia	Alta Spring	Irrigation	Wdn 11 19 20		
5226	8 23 18	Martin Etchemendy	Squaw Well Spring	Stock	App 10 21 19	0.02	
5227	8 23 18	Chas. C. Norton	North Springs	Irrigation	App 1 30 19	0.25	
5230	8 24 18	Fritz Elges	North Summit Spring	Stock	App 8 9 20	0.025	
5231	8 24 18	Fritz Elges	Summit Spring	Stock	App 5 17 20	0.025	
5234	8 27 18	Joseph Hermelion	Old Town Canon Creek	Irrigation	App 2 3 20	0.4	
5235	8 28 18	John Uhalde	Robbers' Roost Spring	Stock	App 3 10 20	0.025	
5236	8 29 18	Sylvain Siard	Rock Creek	Irrigation	App 11 24 19	0.4	
5237	8 29 18	W. B. Vanderlip	Siard Creek	Irrigation	App 11 24 19	0.4	
5238	8 31 18	W. B. Vanderlip	Baker Creek	Power	Den 6 2 19		
5239	8 31 18	Chas. M. Howard	Unnamed source	Irrigation	App 6 9 19	0.65	
5244	9 11 18	Chas. C. Norton	Norton Lake	Irrigation	App 1 20 19	2.4	
5245	9 11 18	Chas. C. Norton	Meadow Lake	Irrigation	App 1 20 19	2.4	
5247	9 16 18	John H. Dolan	Muncy Creek	Irrigation	App 8 19 19	2	
5248	9 17 18	Nevada Wonder Mining Co.	Combination Springs	Irrigation	Den 4 1 20		
5249	9 20 18	Clement Maggini	Monroe Springs No. 2	Mining	App 10 23 19	0.025	
5251	9 20 18	Clement Maggini	Maggini Springs No. 2	Stock	App 10 23 19	0.025	
5252	9 21 18	J. Henry Goodman	Goodman Springs	Irrigation	App 8 6 19	0.2	

STATUS OF APPLICATIONS—Continued

Serial No.	Date of filing	Applicant	Source	Purpose, including domestic	Action on application	Amount allowed	Status of permit
5325	11 27 18	W. A. Moore	Cherry Spring	Stock	App 10 20 19	0.025	
5326	11 27 18	W. A. Moore	Springtime Spring	Stock	App 10 20 19	0.025	
5327	11 27 18	W. A. Moore	North Mud Spring	Stock	App 10 20 19	0.025	
5328	11 27 18	R. M. Bell	Artesian wells	Irrigation	Den 11 17 20		
5329	11 29 18	John W. Freeman Co.	Lee's West Canon	Irrigation	App 6 20 19	1	
5330	12 2 18	W. N. McGill	Peacock Spring	Stock	App 6 27 19	0.025	P.B.U.
5331	12 3 18	C. I. Wadsworth & Bros.	Loat Spring	Stock	App 9 18 19	0.025	
5332	12 3 18	C. I. Wadsworth & Bros.	Willow Spring	Stock	App 9 18 19	0.025	
5333	12 16 18	Chas. H. Taylor	Big Cedar Spring	Stock	App 8 18 19	0.025	
5334	12 16 18	Chas. H. Taylor	Taylor Spring	Stock	Can 6 24 19		
5335	12 16 18	Chas. H. Taylor	Mud Springs	Stock	App 7 25 19	0.025	
5336	12 19 18	Chas. H. Taylor	Unnamed spring	Irrigation	App 6 18 19	0.16	
5337	12 19 18	W. C. Goodman	North Springs	Irrigation	App 11 19 19	0.25	
5338	12 20 18	Henry Williams	Sheep Creek	Irrigation	App 11 19 19	0.6	P.B.U.
5339	12 20 18	Gustaf R. Peterson	Toke Spring	Stock	App 11 11 19	0.025	
5340	12 20 18	Gustaf R. Peterson	Beltschellen Gulch	Stock	App 11 11 19	0.0125	
5341	12 20 18	Gustaf R. Peterson	Beltschellen Gulch	Stock	App 11 11 19	0.0125	
5342	12 20 18	Gustaf R. Peterson	Beltschellen Gulch	Stock	App 11 11 19	0.0125	
5343	12 20 18	Gustaf R. Peterson	Mike's Creek	Stock	Wdn 1 24 20		
5344	12 26 18	John A. Adams	Delamar Flat	Irrigation	App 11 11 19	0.2	
				Stock	App 8 22 19	10 acre-feet	

- CERTIFICATES ISSUED UNDER PERMITS DURING 1919-1920

Cert. No.	Book No.	Permit No.	Name	Source	Purpose, including domestic	Amount	Date issued
428	3	1529	John Angell	Van Duzer Creek	Irrigation	1.3 c.f.a.	4 21 19
429	3	2031	C. C. Turner	West Walker River	Irrigation	0.3618 c.f.a.	5 5 19
430	3	2014	Wm. Stares	Donney Creek	Irrigation	1.509 c.f.a.	5 6 19
431	3	1735	George H. Carter, et al.	American Flat	Irrigation	0.8 c.f.a.	5 6 19
432	3	2062	John E. Schneider	Whites Creek	Irrigation	0.299 c.f.a.	5 6 19
433	3	2095	Danberg Land and Livestock Company	East Carson River	Irrigation	0.67 c.f.a.	5 6 19
434	3	2246	Frank S. Leavitt	Cabin Spring	Irrigation	0.006 c.f.a.	5 6 19
435	3	2248	Dwan H. Young	Owyhee River	Irrigation	0.768 c.f.a.	5 6 19
436	3	2244	United Cattle and Packing Co.	Meadow Creek	Irrigation	0.35 c.f.a.	5 6 19
437	3	2436	Frederick W. H. Simmack	Sheep Creek	Irrigation	0.474 c.f.a.	5 6 19
438	3	2430	L. A. Ruppe, et al.	Nine Mile Canon	Irrigation	2.9258 c.f.a.	5 6 19
439	3	2332	Johannes Haug	Monchant Springs and head of Long Valley waters	Irrigation	0.5 c.f.a.	5 6 19
440	3	2210	Utah Construction Co.	Johnson Creek	Irrigation	15.2124 c.f.a.	5 6 19
441	3	150	George B. Williams	Road Canyon & Skull Canyon Cks.	Irrigation	0.192 c.f.a.	5 6 19
442	3	2184	Jesse Snider	Unnamed stream	Irrigation	0.764 c.f.a.	5 6 19
443	3	2386	Geo. B. Leavitt, et al.	Smoke Creek	Irrigation	2.08 c.f.a.	5 6 19
444	3	2384	Edith R. Gregory, et al.	White River	Irrigation	3.23 c.f.a.	5 6 19
445	3	2714	Henry E. Thompson	Two unnamed springs	Irrigation	0.1 c.f.a.	5 6 19
446	3	2006	John C. Butto	Butto Springs	Irrigation	0.192 c.f.a.	5 6 19
447	3	1703	Albert Welch	North Fork Cottonwood Creek	Irrigation	0.522 c.f.a.	5 6 19
448	3	2383	Ignacio Lenz	Jaca Creek	Irrigation	0.25 c.f.a.	5 6 19
449	3	2304	W. J. Gardner	Dawley's Creek	Irrigation	0.157 c.f.a.	5 6 19
450	3	2701	Alice E. Gardner	Heath's Creek	Irrigation	0.491 c.f.a.	5 6 19
451	3	1929	E. A. Duvivier	Evrand Spring	Irrigation	1.8444 c.f.a.	5 6 19
452	3	2367	Amy M. Prunty	Copper Creek	Irrigation	0.959 c.f.a.	5 6 19
453	3	2350	C. H. Berhman	East Carson River	Irrigation	0.1 c.f.a.	5 6 19
454	3	2342	William A. Moore	Fairy Dell Springs	Irrigation	0.0678 c.f.a.	5 6 19
455	3	2318	Mrs. M. J. Woodward, et al.	Jack Creek	Irrigation	0.8 c.f.a.	5 6 19
456	3	2316	Gentile and R. Georgetta	Choke Cherry and Weaver Can.	Irrigation	0.9 c.f.a.	5 6 19
457	3	2129	Oscar Miller	Owyhee River	Irrigation	2.45 c.f.a.	5 6 19
458	3	2725	Mrs. Kate Harrison	Egan Creek	Irrigation	0.648 c.f.a.	5 6 19
459	3	3335	John W. Richard	Chalk Springs	Stock	0.023 c.f.a.	5 6 19
460	3	3387	John W. Clarke	Ash Spring Creek	Stock	0.11 c.f.a.	7 14 19
461	3	4892	J. W. Clarke	French Boy Canyon Spring	Milling	0.025 c.f.a.	7 14 19
462	3	3127	C. L. Burt	Marble Falls Springs	Mining	0.0312 c.f.a.	9 9 19
463	3	4762	Paris F. Johnson	Cold Spring	Irrigation	0.4 c.f.a.	10 30 19
464	3	2082	G. B. Stannard	Cat Creek	Irrigation	0.8839 c.f.a.	11 22 19
465	3	5128	Stefan Herzog	Delf's Spring	Stock	0.9539 c.f.a.	11 25 19
466	3	2511	Chaston and Vignolo	Humboldt River	Irrigation	0.025 c.f.a.	12 3 19
467	3	2729	Manuel Mashado	Mashado Spring	Irrigation	0.23 c.f.a.	12 3 19
468	3	4213	W. S. Lamb, et al.	Elderberry Spring	Stock	0.025 c.f.a.	12 3 19
469	3	3927	John Yeland	Four Mile Spring	Irrigation	0.1 c.f.a.	12 3 19
470	3	4777	Dennis Coyle	Buster Spring	Stock	0.0108 c.f.a.	12 3 19

CERTIFICATES—Continued

Cert. No.	Book No.	Permit No.	Name	Source	Purpose, including domestic	Amount	Date issued
471	3	4911	O. C. Houghton	Cottonwood Spring	Stock	0.0125 c.f.a.	12 3 19
472	3	4911	O. C. Houghton	Hines or Meadow Spring	Irrigation	0.04 c.f.a.	12 3 19
473	3	4918	O. C. Houghton	Hines Spring No. 2	Stock	0.025 c.f.a.	12 3 19
474	3	4849	Western Pacific R. R. Co.	Horse Creek Canyon Spring	Transportation	0.1 c.f.a.	12 5 19
475	3	5062	Western Pacific R. R. Co.	Horse Creek Canyon Spring	Transportation	0.15 c.f.a.	12 5 19
476	3	2376	Joseph L. Groux	McAfee Creek and Tributaries	Irrigation	1.67 c.f.a.	12 5 19
477	3	3869	Springer Ranch Co.	Copper Kettle Canon	Stock	0.0025 c.f.a.	12 6 19
478	3	2532	Vineyard Land and Stock Co.	Warm Springs	Irrigation	2.55 c.f.a.	12 6 19
479	3	4542	Virgil and Al Pasquale	Poller Creek	Irrigation	0.25 c.f.a.	12 9 19
480	3	5232	Eureka Land & Stock Co.	Polter Creek	Irrigation	0.3 c.f.a.	12 9 19
481	3	2566	J. M. Brown	Van Dusen Creek	Irrigation	0.3275 c.f.a.	12 11 19
482	3	3362	Desiderio Martinez	Waver Springs	Irrigation	0.395 c.f.a.	12 11 19
483	3	3081	Martin Hachquet, et al.	Waver Springs	Stock	0.025 c.f.a.	12 11 19
484	3	3080	Martin Hachquet, et al.	Mahogany Creek	Stock	0.0375 c.f.a.	12 11 19
485	3	3079	Martin Hachquet, et al.	Rock Spring	Stock	0.025 c.f.a.	12 11 19
486	3	3078	Martin Hachquet, et al.	Double Springs	Stock	0.03125 c.f.a.	12 11 19
487	3	3078	Martin Hachquet, et al.	Phone Springs	Stock	0.025 c.f.a.	12 11 19
488	3	3076	Martin Hachquet, et al.	Shoe Spring	Stock	0.0375 c.f.a.	12 11 19
489	3	3075	Martin Hachquet, et al.	Shoe Spring	Stock	0.025 c.f.a.	12 11 19
490	3	2993	J. A. Gandolfo	Twain Spring	Stock	0.025 c.f.a.	12 19 19
491	3	2993	Bert Shedd, et al.	Miller Basin Spring	Irrigation	0.3665 c.f.a.	1 28 20
492	3	4703	Nick Ratto	Water Canon Spring	Stock	0.025 c.f.a.	1 31 20
493	3	4703	Nick Ratto	Water Canon Spring	Stock	0.025 c.f.a.	1 31 20
494	3	4095	W. H. Berg	Mining Canyon Spring	Stock	0.0125 c.f.a.	1 31 20
495	3	4163	Joseph Oxborrow	Granite Canon	Domestic	0.237 c.f.a.	6 10 20
496	3	4941	John Unalhe	Oxbow Springs	Irrigation	0.025 c.f.a.	6 23 20
497	3	3041	Anna Boyan	Burke Springs	Stock	0.3592 c.f.a.	6 23 20
498	3	2976	Frank L. Marker	Bishop Gulch	Irrigation	0.1641 c.f.a.	7 28 20
499	3	3282	Frank L. Marker	Trout Creek and Springs	Irrigation	0.3273 c.f.a.	7 28 20
500	3	3682	Sylvain Slard	Coyote Creek	Irrigation	0.2721 c.f.a.	10 15 20

PROOFS OF APPROPRIATION OF WATER FILED DURING THE YEARS 1919-1920

No.	Name	Source of appropriation	Amount claimed	Purpose
01601	Seymour D. Riley	Washburn or Wash O'Neal Creek	50 acres	Irrigation
01602	H. E. Love	Upper and Lower Crow Spring	0.025 c.f.s.	Stock
01603	H. E. Love	Rock Spring	0.0125 c.f.s.	Stock
01604	Pete Chango and Jean Aldax	Indian or Pony Spring	for 2,000 sheep	Stock
01605	Merl F. Schofield	Lost Spring	0.025 c.f.s.	Stock
01606	Merl F. Schofield	Willow Spring	0.025 c.f.s.	Stock
01607	Merl F. Schofield	Rye Grass Spring	0.025 c.f.s.	Stock
01608	Jas. B. and Tweed A. Wilson	Back Spring	for 100 cattle	Stock
01609	Otto Q. Daniels	Clear Creek	320 acres	Irrigation
01610	Sylvain Stard	Dutch John's Springs	0.5 c.f.s.	Stock
01611	Sylvain Stard	Cherry Creek and springs	1 c.f.s.	Stock
01612	John G. Taylor	Rocky Canon Creek	38.45 acres	Irrigation
01613	John E. Nav	Willow tunnel	112.278 acres	Irrigation
01614	Geo. Doyle et al.	Jack Spring	3 c.f.s. (approx.)	Placer mining
01615	John G. Taylor	Panther Creek	126.9 acres	Irrigation
01616	John G. Taylor	Spring Gulch	47.2 acres	Irrigation
01617	Garat & Co.	White Rock Creek	160 acres	Irrigation
01618	Los Angeles & Salt Lake R. R. Co.	Muddy River	0.04646 c.f.s.	Railroad use
01619	Isaiah and Anna Cox	Muddy River	46 c.f.s.	Irrigation
01620	G. S. Holmes and Julia M. Knox	Muddy River	46 c.f.s.	Irrigation
01621	Geo. Baldwin	Muddy River	46 c.f.s.	Irrigation
01622	Sadie George	Muddy River	46 c.f.s.	Irrigation
01623	Moapa & Salt Lake Produce Co.	Muddy River	24.8 c.f.s.	Irrigation
01624	Joseph Perkins	Muddy River	24.8 c.f.s.	Irrigation
01625	Jacob Bloedel	Muddy River	24.8 c.f.s.	Irrigation
01626	D. H. Livingston	Muddy River	0.0298 c.f.s.	Irrigation
01627	Muddy Valley Irrigation Co.	Muddy River	238 c.f.s.	Irrigation
A01627	Muddy Valley Irrigation Co.	Muddy River	242.25 acres	Irrigation
B01627	Muddy Valley Irrigation Co.	Muddy River	463.25 acres	Irrigation
C01627	Muddy Valley Irrigation Co.	Muddy River	46 acres	Irrigation
D01627	Muddy Valley Irrigation Co.	Muddy River	157.50 acres	Irrigation
E01627	Muddy Valley Irrigation Co.	Muddy River	239.80 acres	Irrigation
F01627	Muddy Valley Irrigation Co.	Muddy River	466 acres	Irrigation
G01627	Muddy Valley Irrigation Co.	Muddy River	119 acres	Irrigation
H01627	Muddy Valley Irrigation Co.	Muddy River	420.45 acres	Irrigation
I01627	Muddy Valley Irrigation Co.	Muddy River	90.55 acres	Irrigation
J01627	Muddy Valley Irrigation Co.	Muddy River	0.05 c.f.s.	Stock
01628	James Ryan	Cabin Spring	0.025 c.f.s.	Stock
01629	Ambro Rosachi	Summit Spring	46 acres	Irrigation
01630	Mrs. Rachel Stewart	Ash Spring Creek	3 acres	Irrigation
01631	J. H. Mitchell	Muddy River	0.1 c.f.s.	Stock
01632	James Ryan	Carden Spring	0.025 c.f.s.	Stock
01633	W. H. Boundy	Basin Spring	0.025 c.f.s.	Stock
01634	W. H. Boundy	Crystal Spring	0.025 c.f.s.	Stock
01635	John F. Perkins	Muddy River	2 acres	Irrigation
01636	Adams-McGill Co.	Jones Spring	0.25 c.f.s.	Stock

PROOFS OF APPROPRIATION—Continued

No.	Name	Source of appropriation	Amount claimed	Purpose
01637	Adams-McGill Co.	Connors Spring	0.1 c.f.a.	Stock
01638	John Lawton Butler	Current Creek	274.66 acres	Irrigation
01639	Sylvain Siard	Kyle's Springs and Creek	0.25 c.f.a.	Stock
01640	H. F. Rutherford	Current Creek	68.53 acres	Irrigation
01641	John W. Manson	Current Creek	49.18 acres	Irrigation
01642	Geo. A. Manson	Current Creek	140 acres	Irrigation
01643	W. J. Powers	Muddy River	25 acres	Stock
01644	Albert Rosenlund	Gravel Spring	0.025 c.f.a.	Stock
01645	Albert Rosenlund	Grouse Spring	0.025 c.f.a.	Stock
01646	Albert Rosenlund	Rock Spring	0.025 c.f.a.	Stock
01647	Cazier Brothers	Current Creek	99.01 acres	Irrigation
01648	Chas. S. Miller	Eight Mile Creek	100 acres	Irrigation
01649	Nick Modarelli	Bald Mountain Spring	0.025 c.f.a.	Stock
01650	Murray Sheep Company	Lake Creek	2.5 c.f.a.	Stock
01651	Charles Smith	Lake Creek	160.8 acres	Irrigation
01652	Leo C. Winder	Lake Creek	77 acres	Irrigation
01653	Adams-McGill Company	Sting Nettle Spring	0.025 c.f.a.	Stock
01654	Gardner Ranch Company	Hughie Spring	0.025 c.f.a.	Stock
01655	A. Musil & Sons	Old River (Carson River)	200 acres	Irrigation
01656	Adams-McGill Company	Clark Spring	0.025 c.f.a.	Stock
01657	Adams-McGill Company	Rose Spring	0.025 c.f.a.	Stock
01658	Adams-McGill Company	Sage Hen Spring	0.3 c.f.a.	Stock
01659	Adams-McGill Company	Quartzite Spring No. 1	0.3 c.f.a.	Stock
01660	Adams-McGill Company	Quartzite Spring No. 2	0.3 c.f.a.	Stock
01661	Adams-McGill Company	South Horse Camp Spring	0.025 c.f.a.	Stock
01662	Adams-McGill Company	Basin Spring	0.025 c.f.a.	Stock
01663	Adams-McGill Company	Horse Camp Spring No. 2	0.06 c.f.a.	Stock
01664	Adams-McGill Company	Summit Spring	0.025 c.f.a.	Stock
01665	Adams-McGill Company	Spring Valley Spring	0.025 c.f.a.	Stock
01666	Adams-McGill Company	Buck Spring No. 1	0.025 c.f.a.	Stock
01667	Adams-McGill Company	Buck Spring No. 2	0.025 c.f.a.	Stock
01668	Adams-McGill Company	Buck Spring No. 3	0.025 c.f.a.	Stock
01669	Adams-McGill Company	Bennett Spring	0.025 c.f.a.	Stock
01670	Adams-McGill Company	Horse Camp Spring No. 1	0.025 c.f.a.	Stock
01671	Adams-McGill Company	Cougar Spring	0.025 c.f.a.	Stock
01672	Adams-McGill Company	Rock Spring	0.025 c.f.a.	Stock
01673	Adams-McGill Company	Upper Cattle Camp Spring	0.025 c.f.a.	Stock
01674	Adams-McGill Company	Lower Cattle Camp Spring	0.06 c.f.a.	Stock
01675	Adams-McGill Company	Brush Spring	0.025 c.f.a.	Stock
01676	Adams-McGill Company	Antelope Spring	0.025 c.f.a.	Stock
01677	Adams-McGill Company	Meadow Spring	1 c.f.a.	Stock
01678	Adams-McGill Company	North Branch Sheep Creek	1 c.f.a.	Stock
01679	Adams-McGill Company	South Branch Sheep Creek	1 c.f.a.	Stock
01680	Adams-McGill Company	Sheep Creek	1 c.f.a.	Stock

01681	Adams-McGill Company	North Creek	1 c.f.a.	Stock
01682	Sylvain Slard	Coyote Springs	0.1 c.f.a.	Stock
01683	Montero and Company	Leonard Creek	28.95 acres	Irrigation
01684	Allied Land and Livestock Company	Mt. Hicks runoff	20 acre-feet	Stock
01685	H. F. Powell	Power Spring	0.025 c.f.a.	Stock
01686	James Doure	Siegel Creek	44.9 acres	Irrigation
01687	Dunston Estate	Cabin Springs	1 c.f.a.	Stock
01688	John Taylor	Six Mile Creek	270.5 acres	Irrigation
01689	United Cattle and Packing Company	Stinking Springs	0.025 c.f.a.	Stock
01690	Lamond C. Woods	Spring, East Fork Clover Valley Creek	86.1 acres	Irrigation
01691	Sylvain Slard	Spring, North Fork Clover Valley Creek	11.43 acres	Irrigation
01692	Sylvain Slard	Coyote Springs	5.08 acres	Irrigation
01693	Sylvain Slard	Gooseberry Springs	24.58 acres	Irrigation
01694	Sylvain Slard	Gooseberry Creek	35.42 acres	Irrigation
01695	Sylvain Slard	Slard Springs	14 acres	Irrigation
01696	Geyser Land and Cattle Co.	Wall Spring	0.025 c.f.a.	Stock
01697	Geyser Land and Cattle Co.	Mahogany Spring	0.025 c.f.a.	Stock
01698	Geyser Land and Cattle Co.	Cabin Spring	0.025 c.f.a.	Stock
01699	Geyser Land and Cattle Co.	Canyon Spring	0.025 c.f.a.	Stock
01700	J. E. Jack	Six Mile Creek	220.4 acres	Irrigation
01701	Laborde Bros. & Co.	South and North Forks Silver Creek	107.45 acres	Irrigation
01702	Laborde Bros. & Co.	Carico Springs	55.8 acres	Irrigation
01703	Claus Schoer	Rice Creek	55 acres	Irrigation
01704	Thos. C. Tennille	Meadow Valley Wash	27.8 acres	Irrigation
01705	J. L. Sharp	Spring Creek	196.43 acres	Irrigation
01706	J. H. Bradish	McClain or Grove Springs	Fraction of acre	Irrigation
01707	J. H. Bradish	West Branch Rice Creek	Fraction of acre	Irrigation
01708	Adolf Wehrman	East Branch Rice Creek	0.33 acre	Irrigation
01709	Bert Selkirk	East Carson River	71 acres	Irrigation
01710	Peter Irlbarne	East Carson River	Fraction of acre	Irrigation
01711	Regina I. Rajah	East Carson River	0.33 acre	Irrigation
01712	Carlo M. Raffetto	Main Carson River	Fraction of acre	Irrigation
01713	Hulda S. Jensen	East Carson River	0.33 acre	Irrigation
01714	Sydney Dack et al.	East Carson River	Fraction of acre	Irrigation
01715	William Richford	East Carson River	40 acres	Irrigation
01716	C. M. Krummes	Watkins Spring	0.1 c.f.a.	Irrigation
01717	S. C. Anderson	Main Carson River	0.0022 c.f.a.	Stock
01718	Marrifott Brothers	Granite Spring	0.01 c.f.a.	Stock
01719	Gardner Ranch Co.	Laborde Spring	53.33 acres	Irrigation
01720	Laborde Brothers & Co.	Bernd or Boone Creek	81.86 acres	Irrigation
01721	Stan John Laborde	North Fork Silver Creek	40 acres	Irrigation
01722	U. S. Indian service	Overland Creek	198.76 acres	Irrigation
01723	Michel Cadet	Hall Creek	47.7 acres	Irrigation
01724	Crystal Land Co.	Overland Creek	12.94 acres	Irrigation
01725	Minnie E. Hider	Duck Creek in Galena Canyon	106.53 acres	Irrigation
01726	Henry A. Williams, et al.	Nye Canyon	0.03 c.f.a.	Stock
01727	Murry Sheep Co.	Packtrail Spring	0.03 c.f.a.	Stock
01728	Murry Sheep Co.	White Rock Springs	0.03 c.f.a.	Stock
01729	Murry Sheep Co.	Bailey Spring No. 1	0.03 c.f.a.	Stock
01730	Murry Sheep Co.	Bailey Spring No. 2	0.03 c.f.a.	Stock

PROOFS OF APPROPRIATION—Continued

No.	Name	Source of appropriation	Amount claimed	Purpose
01731	Labadie Brothers & Co.	Spring North Fork Silver Creek	0.01 c.f.a.	Stock
01732	Arnold Settlement	East Carson River	33.5 acres	Irrigation
01733	C. V. Cole	Charley Cray Spring	0.05 c.f.a.	Stock
01734	C. V. Cole	Tunnel Spring	0.025 c.f.a.	Stock
01735	C. V. Cole	Choke Cherry Springs	0.05 c.f.a.	Stock
01736	C. V. Cole	Evans Spring	0.025 c.f.a.	Stock
01737	C. V. Cole	Lodge Spring	0.025 c.f.a.	Stock
01738	C. V. Cole	Pine Spring	0.025 c.f.a.	Stock
01739	C. V. Cole	Tuff Springs	0.025 c.f.a.	Stock
01740	C. V. Cole	Tuffery Spring No. 1	0.025 c.f.a.	Stock
01741	C. V. Cole	Tuffery Spring No. 2	0.025 c.f.a.	Stock
01742	C. V. Cole	Rock Spring	1 acre	Irrigation
01743	Mr. M. R. Holmdrup	East Carson River	20.8 acres	Irrigation
01744	H. W. Settlemyer	West Carson River	36 acres	Irrigation
01745	D. L. Jones	West Carson River	36.50 acres	Irrigation
01746	Jean Alden and P. Chango	East Carson River	38.97 acres	Irrigation
01747	C. L. and C. J. Fulsome	East Carson River	714.45 acres	Irrigation
01748	J. F. Short	Oreland Creek	185.9	Irrigation
01749	Labadie Bros. & Co.	Reese River	238.25 acres	Irrigation
01750	Labadie Bros. & Co.	Cottonwood or Schmidt Creek		Irrigation

SUMMARY OF ACTION TAKEN DURING THE YEARS 1919-1920 ON APPLICATIONS AND PERMITS TO APPROPRIATE WATER

Applications filed during the year 1919 (Serial numbers 5346 to 5927 inclusive)	582
Applications returned for correction during year 1919.....	264
Applications filed during the year 1920 (Serial numbers 5928 to 6366 inclusive)	439
Applications returned for correction during year 1920.....	186
Applications approved during years 1919-1920.....	540
Applications denied during years 1919-1920.....	94
Permits and applications canceled during years 1919-1920.....	304
Applications and permits withdrawn during years 1919-1920.....	42
Certificates issued during years 1919-1920.....	73
Proofs of appropriation filed during years 1919-1920.....	171
Proofs of commencement of work filed during years 1919-1920.....	547
Proofs of completion of work filed during years 1919-1920.....	439
Proofs of application of water to beneficial use filed during the years 1919-1920	329
Protests filed against the granting of applications during the years 1919-1920	462

MAILING LIST AND CORRESPONDENCE

The following were mailed from this office during the years 1919-1920:

First-class mail (exclusive of registers).....	15,081
Registered letters and parcels.....	2,302
Mail matter of second-class.....	925

ACKNOWLEDGMENTS

In conclusion the State Engineer desires to express his indebtedness to Messrs. R. A. Allen, B. G. McBride, H. M. Payne, M. E. Jepsen, L. H. Taylor, Ira MacFarland, P. P. Jones, E. A. Brown and other associates for their untiring and effective assistance in promoting the work of the office. Special acknowledgment is also due to the officers and members of the various water users' associations of the State who have at all times cooperated with the office in every consistent manner.

APPENDIX

EXECUTIVE BUDGET REPORT ON INCOME, EXPENDITURES, AND SERVICES

I. (a) Income State Engineer Department

Source	Actual Income		Estimated Income	
	1919	1920	1921	1922
STATE APPROPRIATIONS—				
Salary State Engineer and Assistant.....	\$7,200.00	\$7,600.00	\$7,600.00	\$7,600.00
Support of routine work of office.....	13,754.49	11,245.51	14,000.00	14,000.00
Legal			3,000.00	3,000.00
Fireproof filing-cases.....			5,000.00	
Total	\$20,954.49	\$18,845.51	\$29,600.00	\$24,600.00
Fees—				
Applications	\$3,940.00	\$6,385.00	\$10,322.50	\$10,322.50
Permits	1,842.61	1,789.00	6,369.50	6,369.50
Proofs of appropriation.....	415.00	440.00	427.50	427.50
Miscellaneous fees.....	1,876.50	1,472.00	1,784.50	1,784.50
Total	\$13,074.11	\$10,556.00	\$18,854.00	\$18,854.00

I. (b) Adjudications

State appropriation.....			\$12,500.00	\$12,500.00
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I. (c) Cooperative Investigations

State appropriation.....	\$4,500.00	\$4,500.00	\$2,500.00	\$2,500.00
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I. (d) Engineering Experimentation

State appropriation.....	\$1,750.00	\$1,750.00	\$1,750.00	\$1,750.00
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I. (e) Snow Surveys

State appropriation.....	\$750.00	\$750.00	\$750.00	\$750.00
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II. (a) Expenditures State Engineer Department

	Actual Expenditures		Estimated Expenditures	
	1919	1920	1921	1922
SALARIES—				
State Engineer and Assistant.....	\$7,200.00	\$7,600.00	\$7,600.00	\$7,600.00
Clerks and stenographers.....	6,296.15	4,662.37	5,700.00	5,700.00
Field and Office Engineers.....	2,150.00	1,539.65	5,400.00	5,400.00
Totals	\$15,646.15	\$13,802.02	\$18,700.00	\$18,700.00
TRAVELING EXPENSE—				
Automobile	\$1,393.77	\$1,626.37	\$1,000.00	\$1,000.00
Train	922.06	593.12	600.00	600.00
Subsistence	837.35	695.04	700.00	700.00
Miscellaneous	48.81	75.86		
Total	\$3,201.99	\$2,989.89	\$2,300.00	\$2,300.00
SUPPLIES—				
Stationery and stamps.....	\$537.56	\$233.96	\$400.00	\$400.00
Telephone, telegraph, and express.....	234.67	208.89	200.00	200.00
Totals	\$772.23	\$442.85	\$600.00	\$600.00
MISCELLANEOUS—				
Legal expense, transcripts, etc.....	\$300.20	\$693.00	\$3,000.00	\$3,000.00
EQUIPMENT (Asset)—				
Automobile and parts.....	\$895.00	\$759.70	\$400.00	\$450.00
Fireproof filing-cases, etc.....			5,000.00	
Typewriter	69.10		70.00	
Record books and folders.....	64.97	136.05	30.00	50.00
Miscellaneous	4.85			
Totals	\$1,033.92	\$895.75	\$5,500.00	\$500.00

II. (b) Adjudication Expenditures

SALARIES—				
Engineer Examiner.....			\$3,600.00	\$3,600.00
Engineer Examiner.....			3,000.00	3,000.00
Two Testimony Reporters.....			4,200.00	4,200.00
Total			\$10,800.00	\$10,800.00

	Actual Expenditures		Estimated Expenditures	
	1919	1920	1921	1922
TRAVELING EXPENSE—				
Automobile			\$600.00	\$600.00
Train			400.00	400.00
Subsistence			700.00	700.00
Total			\$1,700.00	\$1,700.00
WATER RESOURCES—				
II. (c) Cooperative Investigations				
Salaries Gage Observers and Dist. Eng....	\$1,481.35	\$1,561.57	\$1,500.00	\$1,500.00
TRAVELING EXPENSE—				
Automobile	\$555.73	\$542.91		
Train	58.18	7.30		
Subsistence	318.00	309.28		
Total	\$926.91	\$859.49	\$900.00	\$900.00
SUPPLIES—				
Repairs	\$127.99	\$42.69	\$100.00	\$100.00
IRRIGATION—				
Salaries, Engineers.....	\$1,918.00	\$80.00		
TRAVELING EXPENSE—				
Automobile	\$473.97			
Train	86.89			
Subsistence	345.55			
Miscellaneous	41.01			
Total	\$947.42			
SUPPLIES—				
Stationery		\$16.02		
Telegrams, express, etc.....	\$26.96			
Total	\$26.96	\$16.02		
MISCELLANEOUS—				
Transcripts, etc.....	\$46.60			
EQUIPMENT—				
Automobile and parts.....	\$965.00			
SALARIES—				
II. (d) Engineering Experimentation Expenditures				
Field Engineers and other services.....	\$1,015.00	\$18.11	\$1,000.00	\$1,000.00
TRAVELING EXPENSE—				
Automobile	\$842.66			
Train	52.06			
Subsistence	524.60			
Miscellaneous	21.40			
Total	\$1,440.72		\$300.00	\$300.00
SUPPLIES—				
Stamps, etc.....			\$50.00	\$50.00
MISCELLANEOUS—				
Repairs, lumber, etc.....	\$144.52			
Publications			\$150.00	\$150.00
Freight, hauling and operation of pump- ing machinery			250.00	250.00
Total	\$144.52		\$400.00	\$400.00
EQUIPMENT (Asset)				
Engine and pump.....	\$881.65			
SALARIES—				
II. (e) Snow Survey Expenditures				
Engineers and other employees.....	\$194.51	\$390.29	\$400.00	\$400.00
TRAVELING EXPENSE—				
Automobile	\$46.99	\$34.47		
Train	58.10	8.66		
Subsistence	63.65	82.59		
Total	\$168.74	\$70.72	\$100.00	\$100.00
SUPPLIES—				
Stationery, etc.....	\$42.60	\$55.70	\$50.00	\$50.00
MISCELLANEOUS—				
Repairs, telegrams, etc.....	\$102.83	\$82.94	\$100.00	\$100.00
EQUIPMENT—				
Instruments and other equipment.....	\$168.98	\$222.69	\$100.00	\$100.00

III. (a) Services Rendered by the Engineer's Office

On account of the complexity of the rights involved and the consequent necessity of having hearings and inspections on the ground, a substantial part of the work of the State Engineer's office is conducted in the field. During the past two years, the Engineer and his assistants have made 486 field inspections of applications for approval or rejection; conducted 103 hearings of contests; attended 48 meetings with water users' associations, boards of directors of irrigation districts, etc., and made 51 detailed inspections and surveys of proofs of appropriation submitted in adjudication proceedings. The Engineer was also required to appear on six occasions before District Courts in judicial cases involving water rights. These 694 inspections, meetings and appearances involved a travel of about 30,000 miles by rail and 26,000 miles by auto, and covered all parts of the State.

During the biennium, adjudication proceedings were completed and findings submitted to the court on the waters of the Muddy River, Currant Creek and Clear Creek. Findings are practically ready for submission to the Court on the waters of Carson River, Rice Creek, Siegel Creek and Six-mile Creek. Marked progress has been made in the Humboldt River adjudication, the checking of surveyed areas being about 99% complete and the rechecking of cultures being about 35% complete. In addition, 540 permits for use of various waters have been granted, 136 applications have been rejected or withdrawn, and 304 permits or applications canceled.

Another heavy burden of work on the office lies in the checking of proofs of beneficial use submitted by permit-holders, 329 of which were filed and acted upon during the past two years.

The State Engineer also supervised the distribution of water on the Walker, Carson and Muddy Rivers, and on South Fork, Duckwater, Currant and Lamoille Creeks.

(b) Summary of Recommendations.

1. Increase the fees of the office in order to produce more revenue to the State.

2. Amend the State Water Law relating to adjudications to allow contests to be filed against findings of the State Engineer instead of against claims of appropriators, thereby saving time, expense and unnecessary antagonism between contestants. Also enact legislation to permit District Court Judges to enter interlocutory decrees governing amounts of water allotted to lands.

3. Amend the law relating to employment and compensation of water commissioners in order to permit adequate salaries to be paid and to insure speedy collection of assessments to pay for the services.

4. The enactment of legislation requiring the installation of substantial control gates and dams and ditches when the State Engineer deems such installation necessary for regulating flow of water.

5. Increase the length of office hours required of the State Engineer's office.

The above recommendations are discussed in detail in the body of the Engineer's report.



STATE OF NEVADA

BIENNIAL REPORT

OF THE

NEVADA TAX COMMISSION

1919=1920



CARSON CITY, NEVADA

STATE PRINTING OFFICE : : : JOE FARNSWORTH, SUPERINTENDENT

1921



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LETTER OF TRANSMITTAL

OFFICE OF NEVADA TAX COMMISSION,
CARSON CITY, NEVADA, December 31, 1920.

*To the Honorable the Governor, and Members of the Legislature of the
State of Nevada.*

GENTLEMEN: In compliance with the statutes this biennial report of
the Nevada Tax Commission is respectfully submitted.

EMMET D. BOYLE, *Chairman,*
J. F. SHAUGHNESSY,
W. N. MCGILL,
MOSES REINHART,
P. Y. GILLSON,
F. W. LOCKMAN,
S. J. ROGERS,

F. N. FLETCHER, *Secretary.*

Commissioners.

MINUTES OF THE MEETING OF THE NEVADA TAX COMMISSION

MONDAY, JANUARY 13, 1919

Meeting called to order by J. F. Shaughnessy, Acting Chairman.

Present—J. F. Shaughnessy, W. N. McGill, F. W. Lockman, P. Y. Gillson, M. Reinhart, Commissioners, and F. N. Fletcher, Secretary.

Absent—E. D. Boyle, Chairman.

Mr. Shaughnessy stated that this was the time set for the annual meeting of the Nevada Tax Commission sitting as an assessing board, and was ready to take up any matters which might be presented for consideration and action.

The Secretary reported that the schedules adopted by the State Board of Equalization at its meeting last year should be adopted by the Tax Commission for 1919. Said schedules were taken up as follows:

Land Classification, 1919

Special—

All lands over \$90 per acre.

Cultivated—

First-class	\$90 per acre
Second-class	65 per acre
Third-class	50 per acre
Fourth-class	35 per acre

Wild Hay or Meadow—

First-class (1 or more tons to the acre)	\$30 per acre
Second-class (less than 1 ton to the acre)	18 per acre

Also any other land of same value due to special conditions.

Pasture—

First-class	\$30 per acre
Second-class	20 per acre
Third-class	11 per acre
Fourth-class	7 per acre

Arable—

Left to Assessors.

Grazing—

First-class	\$15 per acre
Second-class	10 per acre
Third-class	5 per acre
Fourth-class	3 per acre
Fifth-class	2 per acre

All lands of these values not included in any other class.

Barren—

All lands of this character	\$1.25 per acre
-----------------------------------	-----------------

NOTE—Cultivated land shall include all vegetable, orchard, grain, timothy, red top, alfalfa, or any other land of same value as cultivated due to special conditions.

First-class cultivated is land capable of producing five tons of alfalfa, one and one-half tons of timothy or red top, or one ton of grain per acre.

Second-class cultivated is land capable of producing three to five tons of alfalfa, less than one and one-half tons of timothy, or fourteen hundred or two thousand pounds of grain per acre.

Third-class cultivated is land capable of producing two to three tons of alfalfa, or eight hundred or fourteen hundred pounds of grain per acre.

Fourth-class cultivated is land capable of producing less than two tons of alfalfa, or less than eight hundred pounds of grain per acre.

On motion duly made, seconded and carried, the land classification for 1919 was adopted.

Livestock Classification, 1919

Stock cattle, including all calves born in 1918, per head	\$38.00
Assessment of all other cattle	Left to Assessor

Horses, work	Left to Assessor
Horses, saddle	Left to Assessor
Horses, buggy	Left to Assessor
Horses, stock	Left to Assessor
Stallions	Left to Assessor
Brood mares	Left to Assessor
Mules, work	Left to Assessor
Mules, stock	Left to Assessor
Jacks	Left to Assessor
Jennies	Left to Assessor
Burros	Left to Assessor
Sheep, per head.....	\$9.00
Bucks, per head.....	12.00
Hogs, per head.....	12.00
Pigs, per head.....	4.00
Bees, per stand.....	3.50
Assessment of all other stock.....	Left to Assessor

On motion duly made, seconded and carried, the livestock classification for 1919 was adopted.

Assessment of Merchandise Stocks, 1919

The last previous inventory shall be taken as the basis of valuation; provided, the inventory was taken within six (6) months prior to the time of assessment, and a deduction of fifteen per cent (15%) from the inventory value shall be allowed for depreciation; the factor of 90% shall then be applied to find the assessed value.

Under this rule a stock of merchandise showing an inventory value of \$10,000 would have a depreciated value of \$8,500 and an assessed value of \$7,650.

In the application of this rule, it is the duty of Assessors to demand proper inventories of merchandise stocks from the owners, and in case of refusal or neglect on the part of said owners to furnish the same, Assessors will make an arbitrary assessment as provided by law.

On motion duly made, seconded and carried, the schedule for the assessment of merchandise in 1919 was adopted.

Assessment of Motor-driven Vehicles, 1919

Ford cars—

1920 Advance model	90% of cost
1919 Model	80% of list price
1918 Model	65% of list price
1917 Model	50% of list price
1916 Model	35% of list price
1915 Model	20% of list price

Motor Vehicles except Ford cars—

1920 Advance model.....	90% of original cost
1919 Model	85% of list price
1918 Model	75% of list price
1917 Model	55% of list price
1916 Model	40% of list price
1915 Model	30% of list price

On motion duly made, seconded and carried, the schedule for the assessment of motor vehicles was adopted for 1919.

On motion duly made, seconded and carried, the Secretary was instructed to secure the data for the assessment of railroads and public utilities and prepare a bulletin setting forth the same for future action of the Commission.¹

No other business coming before the Commission, on motion made, seconded and carried, a recess was taken subject to the call of the Chair.

¹The assessed values of railroads and public utilities for 1919 appear in the Appendix to this report, to which reference is hereby made.

MINUTES OF THE STATE BOARD OF EQUALIZATION

MONDAY, AUGUST 19, 1919

Meeting called to order by Hon. Emmet D. Boyle, Chairman.

Present—Chairman Boyle; F. W. Lockman, Commissioner; F. N. Fletcher, Secretary; H. A. Morton, Assessor, Churchill County; D. J. O'Leary, Auditor, Clark County; Chris Nelsen, Assessor, Douglas County; W. M. Weathers, Assessor, Elko County; W. J. Hooper, Assessor, Eureka County; A. E. Organ, Assessor, Humboldt County; W. G. Adams, Assessor, Lander County; R. E. Lothrop, Assessor, Lyon County; C. L. Dimock, Deputy Assessor, Mineral County; J. H. Stern, Assessor, Ormsby County; J. A. Jurgenson, Assessor, Pershing County; T. J. Hurley, Assessor, Storey County; John Hayes, Assessor, Washoe County; J. F. Miles, Assessor, White Pine County.

Absent—J. F. Shaughnessy, Commissioner; P. Y. Gillson, Commissioner; Moses Reinhart, Commissioner; W. N. McGill, Commissioner; W. A. Ingalls, Assessor, Esmeralda County; J. W. Wheeler, Assessor, Lincoln County; John Barrier, Assessor, Nye County.

The Chairman stated the first order of business would be the appointment of committees which were as follows:

Livestock—Commissioner McGill, Assessors Weathers, Wheeler, Barrier, and Jurgenson.

Lands—Assessors Organ, Hayes, Morton, and Lothrop.

Banking—Commissioner Reinhart, Assessors Stern, Adams, O'Leary, and Weathers.

Business—Commissioner Gillson, Assessors Hooper, Ingalls, Dimock, and Stern.

Mining—Commissioner Lockman, Assessors Hooper, Miles, Hurley, and Dimock.

Public Utilities—Commissioner Shaughnessy, Assessors Morton, O'Leary, Adams, and Lothrop.

It appearing that several of the Assessors were not present and that the segregations of the tax-rolls from some counties had not been received and filed, on motion duly made, seconded and carried, the Board recessed until Monday, August 25, 1919, at the hour of 10 a. m.

MONDAY, AUGUST 25, 1919

Meeting called to order by Commissioner Reinhart.

Present—Moses Reinhart, Commissioner; P. Y. Gillson, Commissioner; H. A. Morton, Assessor, Churchill County; D. J. O'Leary, Auditor, Clark County; W. M. Weathers, Assessor, Elko County; W. A. Ingalls, Assessor, Esmeralda County; W. J. Hooper, Assessor, Eureka County; A. E. Organ, Assessor, Humboldt County; W. G. Adams, Assessor, Lander County; J. B. Wheeler, Assessor, Lincoln County; R. E. Lothrop, Assessor, Lyon County; C. L. Dimock, Deputy Assessor, Mineral County; B. M. Bateman, Deputy Assessor, Nye County; J. H. Stern, Assessor, Ormsby County; J. A. Jurgenson, Assessor, Pershing County; John Hayes, Assessor, Washoe County; J. F. Miles, Assessor, White Pine County.

Absent—Chairman Boyle; J. F. Shaughnessy, W. N. McGill, F. W. Lockman, Commissioners; Chris Nelsen, Assessor, Douglas County; T. J. Hurley, Assessor, Storey County.

The Goldfield Consolidated Water Company, through its attorney, Henry M. Hoyt, and its manager, Chas. G. Patrick, appeared before the Commission and requested a reduction in the assessed valuation of the company's property from \$90,000 to \$60,000. The case was taken under advisement.

The Dunphy Estate, through its attorneys, J. W. Dorsey and Morley Griswold, and one of the owners, Captain X. R. Meyer, appeared and

asked for a classification of its lands in Eureka County and a reduction in the assessed valuation of said lands. The case was submitted and referred to the land committee.

It appearing that the segregations of the tax-rolls were not filed with the Board from all the counties in the State, on motion duly made, seconded and carried, the Board recessed subject to the call of the Chair.

TUESDAY, AUGUST 26, 1919

Meeting called to order by Commissioner Reinhart.

Present—Moses Reinhart, Commissioner; P. Y. Gillson, Commissioner; H. A. Morton, Assessor, Churchill County; D. J. O'Leary, Auditor, Clark County; W. M. Weathers, Assessor, Elko County; W. J. Hooper, Assessor, Eureka County; A. E. Organ, Assessor, Humboldt County; W. G. Adams, Assessor, Lander County; J. B. Wheeler, Assessor, Lincoln County; R. E. Lothrop, Assessor, Lyon County; C. L. Dimock, Deputy Assessor, Mineral County; J. H. Stern, Assessor, Ormsby County; J. A. Jurgenson, Assessor, Pershing County; John Hayes, Assessor, Washoe County; J. F. Miles, Assessor, White Pine County.

Absent—Chairman Boyle; J. F. Shaughnessy, Commissioner; F. W. Lockman, Commissioner; Chris Nelsen, Assessor, Douglas County; W. A. Ingalls, Assessor, Esmeralda County; B. A. Bateman, Deputy Assessor, Nye County; T. J. Hurley, Assessor, Storey County.

The Central Pacific Railway, through its assistant tax attorney, appeared before the Board and requested a reduction in the assessed valuation of its lands in Churchill County. After discussion the case was taken under advisement and referred to the Land Committee.

McGill Mercantile Company, through its owner, William Goodwin, appeared and petitioned for a reduction in the assessed valuation of the merchandise stock of said company from \$48,547 to \$30,600. After discussion the case was taken under advisement and referred to the Committee on Merchandise.

On motion made, seconded and carried, the Board recessed until Wednesday, August 27, 1919, at the hour of 11 a. m.

WEDNESDAY, AUGUST 27, 1919

Meeting called to order by Commissioner Shaughnessy.

Present—J. F. Shaughnessy, Commissioner; P. Y. Gillson, Commissioner; Moses Reinhart, Commissioner; H. A. Morton, Assessor, Churchill County; D. J. O'Leary, Auditor, Clark County; W. M. Weathers, Assessor, Elko County; W. A. Ingalls, Assessor, Esmeralda County; W. J. Hooper, Assessor, Eureka County; A. E. Organ, Assessor, Humboldt County; W. G. Adams, Assessor, Lander County; J. B. Wheeler, Assessor, Lincoln County; R. E. Lothrop, Assessor, Lyon County; C. L. Dimock, Deputy Assessor, Mineral County; B. M. Bateman, Deputy Assessor, Nye County; J. H. Stern, Assessor, Ormsby County; J. A. Jurgenson, Assessor, Pershing County; T. J. Hurley, Assessor, Storey County; John Hayes, Assessor, Washoe County; J. F. Miles Assessor, White Pine County.

Absent—Chairman Boyle; W. N. McGill, Commissioner; F. W. Lockman, Commissioner.

On motion duly made, seconded and carried, it was ordered that all property found to be escaping taxation by the Assessor of any county be placed on the tax-roll by the Assessor or the Auditor.

The Committee on Banks submitted the following report:

To the Honorable State Board of Equalization, Carson City, Nevada.

GENTLEMEN—Your Committee on Banks begs leave to submit the following report and recommendations:

The Committee feels that it is impossible to fix the actual valuations of

banks that will be equitable in all cases, but in arriving at valuations the Committee has followed the uniform rule of using the actual market value of the stock, when known or when reported by the bank, and in other cases of using the capital plus the amount of surplus over the legal requirements.

In a few instances the yearly earnings of certain banks indicate a market value greatly in excess of the values reported by the banks, but the Committee is without definite information as would warrant it in recommending the increases indicated. For these reasons the Committee feels that the various banks should be notified of the valuations herein recommended before final action by this Board and given an opportunity to be heard if they so desire.

The following valuations for assessment purposes are hereby recommended for the various banks:

Churchill County Bank.....	\$71,961
Bank of Fallon.....	45,000
First State Bank of Las Vegas.....	60,000
Douglas County Farmers Bank.....	22,500
Farmers Bank of Carson Valley.....	48,000
Bank of Wells.....	45,000
First National Bank of Elko.....	117,000
Henderson Banking Company.....	162,000
John S. Cook & Company.....	65,000
First National Bank of Winnemucca.....	315,000
Winnemucca State Bank & Trust Company.....	90,000
Quinn River Bank.....	22,500
First National Bank of Lovelock.....	75,600
Lovelock Mercantile Banking Company.....	46,000
Horton Banking Company.....	10,800
Lander County Bank.....	31,500
Bank of Pioche.....	22,500
Lyon County Bank.....	70,672
Mason Valley Bank.....	33,569
Nevada First National Bank, Tonopah.....	90,000
Tonopah Banking Corporation.....	45,000
Carson Valley Bank.....	70,000
Farmers & Merchants National Bank.....	207,000
Reno National Bank.....	630,000
Bank of Nevada Savings & Trust Company.....	90,000
Scheeline Banking & Trust Company.....	113,400
Stockgrowers & Ranchers Bank.....	90,000
Washoe County Bank.....	607,500
Bank of Sparks.....	31,500
Copper National Bank.....	67,500
Ely National Bank.....	22,500
First National Bank of Ely.....	45,000
McGill National Bank.....	27,000

Respectfully submitted,

M. REINHART, *Chairman.*

On motion duly made, seconded and carried, the report of the Banking Committee was adopted, subject to equalization by the Board.

On motion made, seconded and carried, the Board recessed until Monday, September 8, 1919, at 10 a. m.

MONDAY, SEPTEMBER 8, 1919

Meeting called to order by Commissioner J. F. Shaughnessy. All members of the Board present with the exception of Chairman Boyle; F. W. Lockman, Commissioner; Assessors A. E. Organ of Humboldt County, J. H. Stern of Ormsby County, and T. J. Hurley of Storey County.

On motion duly made, seconded and carried, the matter of the

assessments of the State. The Board of Equalization was then adjourned and a resolution passed to the effect that the Board should be continued.

On Monday, September 2, 1919, the Board of Equalization was called to order by Commissioner J. F. Shaughnessy. All members of the Board present, with the exception of Chairman Boyle; F. W. Lockman, Commissioner; and Assessor J. H. Stern of Ormsby County. The Secretary read the following telegram from Hon. Emmet D. Boyce, Chairman:

TUESDAY, SEPTEMBER 2, 1919

Meeting called to order by Commissioner J. F. Shaughnessy. All members of the Board present, with the exception of Chairman Boyle; F. W. Lockman, Commissioner; and Assessor J. H. Stern of Ormsby County.

The Secretary read the following telegram from Hon. Emmet D. Boyce, Chairman:

TUESDAY, SEPTEMBER 2, 1919.

Captain F. N. Fletcher, Secretary State Board of Equalization, Carson City, Nevada.

Am told that the State is in very critical business. Please ask Board to proceed with the matter. The tax collected and five millions will supply all needed funds. May be able to run up for one day this week. BOYLE.

The Secretary presented the state budget for the year beginning December 1, 1919. This budget appears in full as Table No. 14 of this report.

On motion duly made, seconded and carried, 3,000 head of sheep were added to the assessment of Adams-McGill Company in Lincoln County and 3,000 head of sheep added to the assessment of said company in Nye County for the purposes of equalization between the counties.

Commissioner Gillson called the attention of the Board to decreases in the assessed valuations of certain counties as shown by the tax-rolls and the various Assessors were called upon to explain said decreases. After a full discussion of the matter, and on motion duly made, seconded and carried, the Board recessed until Wednesday, September 10, 1919, at the hour of 10 a. m.

WEDNESDAY, SEPTEMBER 10, 1919

Meeting called to order by Commissioner J. F. Shaughnessy. All members of the Board present, with the exception of Chairman Boyle; F. W. Lockman, Commissioner; and Assessor J. H. Stern of Ormsby County.

Commissioner Gillson, as Chairman of the Special Committee appointed to increase the valuations of the State sufficient to cover the budget requirements, reported that the Committee was not ready to make a definite report and desired a further discussion of the matter by the full Board. A statement of the situation was made by Commis-

sioner Gillson and the opinions of the various Assessors were asked as to the proper course to be pursued. A general discussion followed, which occupied the entire day.

On motion duly made, seconded and carried, the Board recessed until Thursday, September 11, 1919, at the hour of 10 a. m.

THURSDAY, SEPTEMBER 11, 1919

Meeting called to order by Commissioner J. F. Shaughnessy. All members of the Board present with the exception of Chairman Boyle and F. W. Lockman and Moses Reinhart, Commissioners.

The session was devoted to a continuance of the discussion of the proper method of increasing the State valuation to cover the budget requirements. The special matter under discussion being the valuation of railroad lands, Messrs. D. V. Cowden, Tax Attorney, and H. W. Hobbs, Assistant Tax Attorney, representing the Central Pacific Railway, were present and offered testimony with reference to the valuation of railroad lands in the State.

On motion duly made, seconded and carried, the Board recessed until Friday, September 12, 1919, at the hour of 10 a. m.

FRIDAY, SEPTEMBER 12, 1919

Meeting called to order by Commissioner J. F. Shaughnessy. All members of the Board present with the exception of Chairman Boyle and F. W. Lockman, Commissioner.

Mr. G. H. Taylor, Cashier of the Washoe County Bank, appeared and asked for a reduction in the assessed valuation of the stock of said bank from \$140 to \$120 per share. Mr. Taylor entered into a full discussion of the proper method of assessing bank stocks.

Mr. M. D. Fairchild, Cashier of the Stockgrowers & Ranchers Bank, appeared before the Board and requested a reduction in the assessed valuation of the stock in said bank from \$100 to \$70 per share, or a reduction in the assessed valuation from \$90,000 to \$70,000.

The requests made by the above banks were referred to the Committee on Banking.

The Board then proceeded to a further discussion of the land valuations in this State.

On motion duly made, seconded and carried, the Board recessed until 10 a. m., Saturday, September 13, 1919.

SATURDAY, SEPTEMBER 13, 1919

Meeting called to order by Commissioner J. F. Shaughnessy. All members of the Board present with the exception of Chairman Boyle and F. W. Lockman, Commissioner.

The morning session was devoted to a discussion of the valuation of lands, particularly in Douglas, Lyon and Pershing Counties.

At the afternoon session Mr. H. S. Pohe, Field Agent of the Tax Commission, appeared before the Board and made a statement concerning the work done by him in Churchill, Douglas, Ormsby, Storey, and Washoe Counties. A summary of Mr. Pohe's report appears in the following table:

COMPARISON OF SALES AND MORTGAGES WITH ASSESSED VALUES IN 1919

County	Transfer	No. instruments	Deed or mortgage value	Assessed value	Per cent
Churchill	Deeds—Outside property	54	\$438,600	\$176,994	40.35
	Deeds—Inside property	52	70,000	30,366	43.38
	Mortgages—Outside property	36	214,708	119,771	55.78
	Mortgages—Inside property	12	24,250	23,965	99.97
Douglas	Deeds—Outside property	13	216,000	84,122	38.94
	Deeds—Inside property	19	86,700	30,635	35.33
	Mortgages—Outside and inside property	29	308,510	140,894	46.42
	Deeds—Outside property	5	18,750	8,076	43.07
Ormsby	Deeds—Inside property	8	18,250	14,590	79.89
	Mortgages—Outside property	7	5,500	3,150	57.27
	Deeds—Inside property	7	9,775	8,080	81.66
	Mortgages—Outside property	5	25,610	12,065	45.34
Storey	Deeds—Inside property	5	1,810	1,375	75.96
	Mortgages—Outside property	2	21,000	11,410	54.33
	Deeds—Outside property	58	483,929	161,540	33.38
	Deeds—Inside property	134	325,335	199,810	61.41
Washoe	Mortgages—Outside property	31	324,185	188,150	58.03
	Mortgages—Inside property	58	260,500	194,065	74.53

After further discussion a recess was ordered until Monday, September 15, 1919.

MONDAY, SEPTEMBER 15, 1919

The session was devoted to a further discussion of land valuations in the State, after which a recess was ordered until Tuesday, September 16, 1919.

TUESDAY, SEPTEMBER 16, 1919

The entire session was devoted to a further discussion of the land valuations, after which a recess was ordered until Wednesday, September 17, 1919.

WEDNESDAY, SEPTEMBER 17, 1919

Meeting called to order by Commissioner J. F. Shaughnessy. All members of the Board present, with the exception of Chairman Boyle and F. W. Lockman, Commissioner.

The Special Committee appointed to recommend a plan for increasing the total valuation of the State to cover the budget requirements made the following report:

We find, after careful investigation, that certain lands in Churchill, Douglas, and Pershing Counties are not properly equalized with Lyon County, conditions in these counties on certain classes of lands being very similar. Our conclusion is that the first step to be taken is to place these counties on as near an equal footing as possible.

We recommend that 5,678 acres of arable land in Douglas County, with an average value of \$4.50 per acre, be raised \$20.50 per acre, making the value \$25 per acre as compared with an average valuation of \$25.50 for the counties of Churchill, Lyon, and Pershing, making a total increase of \$90,848.

We recommend that 13,320 acres of grazing land in Douglas County be raised from \$2.62 per acre to \$5.75 per acre, the average of Churchill, Lyon, and Pershing, making a total increase of \$41,691.

We recommend that all private lands, where not assessed at a higher figure, in Townships 13 and 14, Range 18, and Townships 13 and 14, Range 19, be raised to \$4.50 per acre, estimating the acreage at 3½ Townships, or 80,650 acres, making a total increase of \$222,566.

We recommend that 12,746 acres of pasture land in Churchill County, with an average of \$12.08 per acre, be raised \$8.05 per acre, bringing them up to the average value of similar lands in Lyon County, making a total increase of \$102,605.

We recommend that 6,931 acres of pasture land in Pershing County, with an average of \$10.52 per acre, be raised \$7.61 per acre, bringing them up to the

average value of similar lands in Lyon County, making a total increase of \$61,745.

We recommend a 20% increase of all country improvements in the State, increasing the present value of these improvements \$574,233.

We are assuming that the recommendations of the Banking Committee will make an increase of \$451,000 in the total valuation.

After equalizing in this manner, the following tabulation shows the total increase in the valuation of privately owned property in the State:

Arable lands, Douglas County.....	\$90,848
Grazing lands, Douglas County.....	41,691
Mountain lands, Douglas County.....	222,566
Pasture lands, Churchill County.....	102,605
Pasture lands, Pershing County.....	51,745
20% increase on \$2,871,667, country improvements.....	574,233
Estimated increase on banks.....	451,000

Total\$1,534,688

Deducting the above total from \$7,000,000 leaves \$5,465,312 to be raised on privately owned lands having a total valuation of \$30,831,336, or a total increase on present classified values.

After applying the 18% increase, we have the following valuations to be used:

First-class cultivated from.....	\$90.00 to \$108.00 per acre
Second-class cultivated from.....	65.00 to 74.30 per acre
Third-class cultivated from.....	50.00 to 59.00 per acre
Fourth-class cultivated from.....	35.00 to 41.30 per acre
First-class meadow from.....	30.00 to 35.40 per acre
Second-class meadow from.....	18.00 to 21.24 per acre
First-class pasture from.....	30.00 to 35.40 per acre
Second-class pasture from.....	20.00 to 23.60 per acre
Third-class pasture from.....	11.00 to 12.98 per acre
Fourth-class pasture from.....	7.00 to 8.26 per acre
First-class arable from.....	14.66 to 17.29 per acre
Second-class arable from.....	10.92 to 12.88 per acre
Third-class arable from.....	7.04 to 8.30 per acre
Fourth-class arable from.....	3.00 to 3.45 per acre
First-class grazing from.....	15.00 to 17.70 per acre
Second-class grazing from.....	10.00 to 11.80 per acre
Third-class grazing from.....	5.00 to 5.90 per acre
Fourth-class grazing from.....	3.00 to 3.54 per acre
Fifth-class grazing from.....	2.50 to 2.95 per acre
Mountain and barren from.....	1.41 to 1.66 per acre
Unclassified from.....	7.61 to 8.97 per acre

We recommend that a copy of these tabulations be furnished each Assessor, giving him an opportunity to work out his final valuations.

We recommend that Eureka County be given special consideration, as the average values as returned by the Assessor of this county appear to be very much higher than the remaining counties.

Discussion of the report followed.

Mr. Vernon Metcalf, Secretary of the Nevada Livestock Association, and Mr. J. H. Clemons, a land and livestock owner in the State, appeared before the Board and presented evidence to show that the assessment of lands and livestock throughout the State was already too high and should not be increased.

On motion duly made, seconded and carried, the Board adjourned until Thursday, September 18, 1919, at the hour of 10 a. m.

THURSDAY, SEPTEMBER 18, 1919

Meeting called to order by Commissioner Shaughnessy. All members of the Board present with the exception of Chairman Boyle; F. W. Lockman, Commissioner; and John Hayes, Assessor of Washoe County.

The morning session was devoted to a discussion of the report of the Special Committee.

At the afternoon session the report of the Banking Committee was considered and adopted.

On motion duly made, seconded and carried, the assessed valuation of the Washoe County Bank, as recommended by the Banking Committee, was decreased from \$607,500 to \$585,000.

On motion duly made, seconded and carried, the Board recessed until Friday, September 19, 1919, at the hour of 10:30 a. m.

FRIDAY, SEPTEMBER 19, 1919

Meeting called to order by Commissioner J. F. Shaughnessy. All members of the Board present with the exception of Chairman Boyle and F. W. Lockman, Commissioner.

Messrs. Chas. L. Fulstone, H. F. Dangberg, and W. F. Dressler, land-owners in Douglas County, appeared before the Board and gave testimony as to the valuation of various classes of land in that county.

A general discussion of land valuations followed.

On motion made, seconded and carried, the Board recessed until Saturday, September 20, 1919, at the hour of 10:30 a. m.

SATURDAY, SEPTEMBER 20, 1919

Meeting called to order by Commissioner J. F. Shaughnessy. All members of the Board present with the exception of Chairman Boyle; F. W. Lockman and Moses Reinhart, Commissioners.

The report submitted by the Special Committee appointed to recommend a method of increasing the state valuation so as to provide sufficient funds to cover the state budget was further discussed, and on motion duly made, seconded and carried, said report was adopted by the following vote:

AYES—Commissioner Shaughnessy; Commissioner Gillson; Auditor O'Leary. Clark County; Assessor Weathers, Elko County; Assessor Ingalls, Esmeralda County; Assessor Hooper, Eureka County; Assessor Adams, Lander County; Assessor Lothrop, Lyon County; Assessor Dimock, Mineral County; Assessor Bateman, Nye County; Assessor Stern, Ormsby County; Assessor Jurgenson, Pershing County; Assessor Hurley, Storey County; Assessor Miles, White Pine County—14.

NAYS—Commissioner McGill; Assessor Morton, Churchill County; Assessor Neilsen, Douglas County; Assessor Organ, Humboldt County; Assessor Wheeler, Lincoln County; Assessor Hayes, Washoe County—6.

Absent—Chairman Boyle; Commissioners Lockman and Reinhart—3.

After a discussion of the percentage increases of 18% on lands and 20% on country improvements, the Assessors of Churchill, Douglas, Lyon, and Pershing Counties asked for the privilege of reclassifying the lands in their counties. After explanations were made by said Assessors and on motion duly made, seconded and carried, the Assessors of the counties named were granted the privilege of reclassifying their lands.

On motion duly made, seconded and carried, the Board recessed until Tuesday, September 23, 1919, at the hour of 10 a. m.

TUESDAY, SEPTEMBER 23, 1919

Meeting called to order by Commissioner Shaughnessy. All members of the Board present with the exception of Chairman Boyle; F. W. Lockman and Moses Reinhart, Commissioners.

Mr. Shober J. Rogers appeared before the Board and took his seat as a member of the State Board of Equalization and the Tax Commission, having been appointed by Hon. Emmet D. Boyle, Governor, to represent the land interests.

Assessor Neilsen of Douglas County presented a reclassification of certain lands in said county which, upon motion duly made, seconded and carried, was adopted as the classification and assessment of the lands mentioned for 1919. Said classification is as follows:

Arable land—

1,258 acres assessed at \$4.50 per acre be increased to \$20.00 per acre

4,420 acres assessed at 4.50 per acre be increased to 7.50 per acre

Grazing land—

13,320 acres assessed at 2.62 per acre be increased to 5.75 per acre

Mountain land—

112,249 acres assessed at 1.74 per acre be increased to 2.00 per acre

Lake-shore land—

All land on tax-roll designated as "Lake-shore land" assessed at \$25 per acre be increased to \$60 per acre.

Making a total increase in assessed valuation of the lands in said county of \$107,451.

Assessor Hooper of Eureka County moved that the assessment of the Eureka-Nevada Railway be reduced from \$145,075, as it appeared on the tax-roll of said county for 1919, to \$138,075. Said motion being seconded, the same was carried.

Assessor Hooper of Eureka County moved that the assessed valuation of the Eureka Water Company be reduced from \$18,000 to \$16,000.

The Committee on Public Utilities submitted the following report:

To the Honorable State Board of Equalization, Carson City, Nevada.

Your Committee on Public Utilities respectfully submits the following report:

In this connection it should be borne in mind that the final equalization of interstate and intercounty railroads and public utilities for taxation purposes is the function of the Tax Commission at the meeting in October, at which time the valuations may be either raised or lowered after hearings of the parties interested.

Examination of the rolls at the present time discloses the following changes in valuations of railroads and public utilities as compared with 1918:

Railroads—

The following railroads have been discontinued:

Las Vegas & Tonopah Railroad, with a loss to Clark County of \$230,437, and to Nye County a loss of \$297,998.

Silver Peak Railroad with a loss to Esmeralda County of \$42,400.

Public Utilities—

The following private car-lines not previously assessed were added to the tax-rolls in 1919:

Armour Company assessed at.....	\$1,449
Keith Railway Equipment Company.....	1,242
General Chemical Company.....	1,944
Shell Company of California.....	3,952
Western Industries Company.....	1,328

The following private car-lines which were assessed in 1918 had no mileage in Nevada last year, and therefore do not appear on the rolls:

Kingan Refrigerator Company.....	\$1,728
Gen. American Tank Car Company.....	5,119
Santa Fé Refrigerator Dispatch Company.....	9,765

The Pullman Company shows a decrease in its assessment of \$167,901 over 1918, due to a decrease in mileage operated as a result largely of cutting out transcontinental trains.

The American Railway Express shows a decrease of \$10,552, due to a

decrease in the mileage operated, but is to appear before the Tax Commission for equalization.

The Nevada Valleys Power Company shows an increase of \$26,221, due to taking over the S. R. Young Electric Company, which is not assessed this year.

The Golconda Telephone and Power Company shows an increase of \$1,756.

The Bridgeport Telephone and Telegraph Company has a decrease of \$1,407, due to sale of part of its line.

The Bell Telephone Company's assessment has increased \$17,190.

The Western Union Telegraph Company shows a decrease of \$120,190, but this company will file a new and corrected statement of its mileage in Nevada with the Tax Commission on which a reassessment will be based.

On the whole there has been to date a net loss in the assessed valuation of railroads of \$570,835, and of public utilities \$362,683, a total of \$933,468, as compared to the valuations of like properties in 1918.

Upon motion duly made, seconded and carried, the foregoing report of the Committee on Public Utilities was adopted.

The Committee on Mines submitted the following report:

To the Honorable State Board of Equalization, Carson City, Nevada.

GENTLEMEN: Your Committee on mining property respectfully submits the following report:

Churchill County—

We recommend that the assessment of the Flora May Millsite, a patented mining claim, be stricken from the assessment of the Nevada Development Company for the reason the same appears on the roll twice, and, therefore, one assessment should be stricken off. A substantial increase being shown, no change is recommended.

Clark County—

In the matter of a reduction in the assessment of the Sultan Mine, no action has been taken by the Committee for the reason that the Assessor of Clark County has asked for further time to investigate this claim. There is a decrease in this county which the Assessor will explain. No change recommended.

Douglas County—

No change recommended.

Elko County—

We recommend that four patented mining claims assessed to the Bulls-Head Mining Company on the tax-roll of the above county at \$500 each, or a total of \$2,000, be stricken from said roll, an affidavit of labor performed on said mining claims having been filed with this Board.

We recommend that the Long Hike group of patented mining claims assessed to the Elkorra Mines Company at \$500 each, or a total of \$12,000 (there being 24 claims in the group), be stricken from the tax-roll, the proper affidavit of labor performed having been filed with this Board.

We recommend that six patented mining claims assessed to the Nevada Bunker Hill Mining Company at \$500 each, or a total of \$3,000, be stricken from the tax-roll.

We recommend that ten patented mining claims assessed to Geo. A. Royce at \$500 each, or a total of \$5,000, be stricken from the tax-roll of the above county.

Esmeralda County—

We recommend that five patented mining claims assessed to the Reorganized Crackerjack Mining Company at \$500 each on the tax-roll of the above county, or a total of \$2,500, be stricken from said roll.

We recommend that sixteen patented mining claims assessed to the Wilson Silver Consolidated Mines Company at \$500 each, or a total of \$8,000, be stricken from the tax-roll of the above-named county.

We recommend that five patented mining claims assessed to the Red Hill Florence Mining Company at \$500 each, or a total of \$2,500, be stricken from the tax-roll of the above-named county.

Lander County—

We recommend that no changes be made in the assessment of mining property in the above-named counties.

Lincoln County—

We recommend that nine patented mining claims assessed to the Pioche Mines Company at \$500 each, or a total assessment of \$4,500, be stricken from the tax-roll of the above-named county.

We recommend that four patented mining claims assessed to the South-eastern Mining Company at \$500 each, or a total of \$2,000, be stricken from the tax-roll of the above-named county.

We recommend that five patented mining claims assessed to John C. Eames on the tax-roll of the above-named county at \$500 each, or a total of \$2,500, be stricken therefrom.

Lyon County—

We recommend that the assessment of the Great Northern and Wild Horse patented mining claims be placed against the Como Extension Company on the tax-roll of the above-named county in the sum of \$1,000, or \$500 for each claim.

We recommend that one patented mining claim assessed to W. B. Sayers in the sum of \$500 on the tax-roll of the above-named county be stricken therefrom.

We recommend that four patented mining claims, known as the Oest group, assessed to Berdle F. Kemling on the tax-roll of the above-named county in the sum of \$500 each, or a total of \$2,000, be stricken therefrom.

Mineral County—

We recommend that two patented mining claims be assessed to Unknown Owner on the tax-roll of the above-named county in the sum of \$500 each, or a total of \$1,000.

We recommend that one patented mining claim assessed to Treasurer Trustee on the tax-roll of the above-named county be stricken therefrom, and reentered on the roll and assessed to Fred McCall in the sum of \$500.

We recommend that the assessment of the Rockland Mining Company stand as placed on the roll of the above-named county.

We recommend that the assessment of two patented mining claims in the sum of \$500 each, or a total of \$1,000, be stricken from the tax-roll of the above-named county, the said assessment appearing against The Rawhide Consolidated Mines Company.

We recommend that five patented mining claims assessed to the Jumbo Copper Mountain Mining Company in the sum of \$500 each, or a total of \$2,500, be stricken from the tax-roll of the above-named county.

We recommend that two patented mining claims assessed to Grutt and Dunning on the tax-roll of the above-named county in the sum of \$500 each, or a total of \$1,000, be stricken therefrom.

We recommend that two patented mining claims assessed to the Wall Street Copper Company in the sum of \$500 each, or a total of \$1,000, be stricken from the tax-roll.

We recommend that one patented mining claim assessed to Grutt, Dunning & McLeod, in the sum of \$500, be stricken from the roll.

We recommend that nine patented mining claims assessed to the Nevada Victory Mining Company in the sum of \$500 each, or a total of \$4,500, be stricken from the tax-roll.

We recommend that nine patented mining claims assessed to the Rawhide Consolidated Mines Company in the sum of \$500 each, or a total of \$4,500, be stricken from the tax-roll.

Nye, Ormsby, Storey, and Washoe Counties—

No changes are recommended in the assessment of mining property in the above-named counties. Nye County shows a decrease in the assessment of this property which will be explained by the Assessor.

White Pine County—

We recommend that 12 patented mining claims assessed to the Butte & Ely Copper Company on the tax-roll of the above-named county in the sum of \$500 each, or a total of \$6,000, be stricken from the tax-roll.

We recommend that 87 patented mining claims assessed to the Giroux Consolidated Mines Company in the sum of \$500 each, or a total of \$43,500, be stricken from the tax-roll.

We recommend that 61 patented mining claims assessed to the Consolidated

Copper Mines Company at \$500 each, or a total of \$30,500, be stricken from the tax-roll of the above-named county.

We recommend that two patented mining claims assessed to the estate of M. B. Caraghan, J. Munroe and S. M. Callahan on the tax-roll of the above-named county at \$500 each, or a total of \$1,000, be stricken from said roll.

We recommend that two patented mining claims assessed to the Wyoming Mining & Milling Company on the tax-roll of the above-named county at \$500 each, or a total of \$1,000, be stricken from said roll.

Upon motion duly made, seconded and carried, the report of the Mining Committee was adopted.

Commissioner Gillson moved that the assessment factor for 1920 be placed at 100%, or full cash value, for 1920, instead of 90%, as in 1919.

After discussion, the said motion was seconded and carried.

The Committee on Live Stock submitted the following classification and prices for the assessment of live stock in 1920:

Cattle, including all calves born in 1919.....	\$37.00 per head
Bulls.....	100.00 per head and up
Milch cows for dairy purposes.....	75.00 per head and up
Work horses, 1,100 lbs. and up.....	90.00 per head and up
Work horses, 1,100 lbs. and less.....	75.00 per head and up
Saddle horses.....	55.00 per head and up
Stock horses.....	Left to Assessor
Stallions.....	200.00 per head and up
Brood mares.....	50.00 per head and up
Work mules.....	90.00 per head and up
Stock mules.....	50.00 per head and up
Jacks.....	200.00 per head and up
Jennies.....	16.00 per head and up
Burros.....	10.00 per head and up
Sheep.....	8.00 per head
Bucks.....	12.00 per head
Goats.....	3.50 per head and up
Hogs (8 months old and over).....	15.00 per head
Pigs (2 to 8 months old).....	5.00 per head
Poultry.....	.50 per head
Turkeys.....	1.00 per head
Ducks.....	.50 per head
Geese.....	1.00 per head
Bees.....	5.00 per stand

Assessment of all other stock left to Assessors.

After discussion, and upon motion duly made, seconded and carried, the above schedule for the assessment of live stock in 1920 was adopted.

Upon motion duly made, seconded and carried, a recess was taken until Wednesday, September 24, 1919.

WEDNESDAY, SEPTEMBER 24, 1919

Meeting called to order by Commissioner Gillson.

All members of the Board present with the exception of Chairman Boyle; J. F. Shaughnessy, M. Reinhart, and F. W. Lockman, Commissioners; Chris Neilsen and John Hayes, Assessors.

Communications from the Nevada Livestock Association, Clover Mountain Livestock Association, North Fork Livestock Association, United Cattle and Packing Company and the Southern Nevada Cattle Owners Association, protesting against the increase in the assessment of live stock for 1919 and 1920, were read by the Secretary.

The Committee on Merchandise presented the following report on merchandise for the consideration of the Board:

	<i>Assessed 1918</i>	<i>Assessed 1919</i>	<i>Increase or decrease</i>
Churchill County.....	\$146,826	\$110,976	\$35,850*
Clark County.....	83,240	78,590	4,650*
Douglas County.....	62,325	91,385	29,060
Elko County.....	178,182	162,290	15,892*
Esmeralda County.....	73,960	27,178	46,791*
Eureka County.....	34,050	32,421	1,629*
Humboldt County.....	293,862	148,755	145,112
Lander County.....	117,928	92,925	25,003*
Lincoln County.....	48,780	16,935	31,845*
Lyon County.....	144,325	167,092	22,769
Mineral County.....	38,320	34,870	3,450
Nye County.....	299,125	327,651	28,526
Ormsby County.....	54,050	54,460	410
Pershing County.....	.....	116,885	.....
Storey County.....	22,760	18,100	4,660*
Washoe County.....	428,776	430,430	1,654
White Pine.....	390,151	420,124	29,973

* Denotes decrease

Increases

Lyon County.....	46.6%
Nye County.....	15.8%
Washoe County.....	.3%
White Pine County.....	7.7%

Decreases

Churchill County.....	24%
Clark County.....	5½%
Elko County.....	8.97%
Esmeralda County.....	61.3%
Eureka County.....	4½%
Lander County.....	12½%
Mineral County.....	9%
Lincoln County.....	65%
Ormsby County.....	¼ of 1%
Storey County.....	20%

Upon motion duly made, seconded and carried, the report of the Committee on Merchandise was adopted.

The Committee on Business submitted the following report on the assessment of automobiles for 1919:

	<i>No. assessed 1918</i>	<i>Real roll valuation</i>	<i>No. assessed 1919</i>	<i>Real roll valuation</i>	<i>Inc.</i>	<i>Dec.</i>
Churchill County.....	387	\$164,705	404	\$124,981	17	
Clark County.....	326	165,664	326	59,925		
Douglas County.....	233	101,053	289	106,669	56	
Elko County.....	543	258,415	614	343,480	71	
Esmeralda County.....	214	92,587	208	63,197	.....	6
Eureka County.....	98	28,498	96	21,364	2	
Humboldt County.....	533	171,096	332	93,590	.....	15
Lander County.....	112	56,975	124	36,685	12	
Lincoln County.....	101	31,275	106	30,380	5	
Lyon County.....	436	190,854	488	130,302	52	
Mineral County.....	198	85,271	157	38,332	.....	41
Nye County.....	575	271,314	666	213,931	91	
Ormsby County.....	145	63,550	157	41,241	12	
Pershing County.....	.....	.....	186	77,723		
Storey County.....	57	22,854	60	19,451	3	
Washoe County.....	1,222	593,679	1,398	398,267	176	
White Pine County.....	481	203,259	519	162,421	38	

Personal Roll Valuation

Churchill County	\$23,515
Clark County	713
Douglas County	5,065
Elko County	21,920
Esmeralda County	15,000
Eureka County	3,081
Humboldt County	13,262
Lander County	3,140
Lincoln County	350
Lyon County	16,904
Mineral County	6,726
Nye County	63,164
Ormsby County	14,571
Pershing County	6,522
Storey County	5,350
Washoe County	70,470
White Pine County	10,974

Showing a total valuation on the real and personal rolls for 1919 of \$2,683,135 for 6,040 machines assessed over 5,061 machines assessed in 1918 with a valuation of \$2,501,049, showing an increase in the assessed valuation for 1919 of \$182,086.

On motion duly made, seconded and carried, the foregoing report was adopted.

There being no further business to come before the meeting at this time a recess was taken until 10 a. m., Thursday, September 25, 1919.

THURSDAY, SEPTEMBER 25, 1919

Meeting called to order by Commissioner Gillson.

All members of the Board present with the exception of Chairman Boyle; J. F. Shaughnessy, F. W. Lockman and Mosses Reinhart, Commissioners.

The morning session was devoted to making corrections of errors on the tax-rolls requested by the various Assessors.

In the matter of the assessment of the Dunphy Estate lands in Eureka County, upon the recommendation of the Committee On Lands it was moved, seconded and carried, that said lands remain as assessed on the tax-roll without any change.

At this point Commissioner J. F. Shaughnessy was noted present and assumed charge of the meeting as Acting Chairman.

The Committee on Lands presented the following classification for assessment purposes of all lands in 1920.

Special—

Special land is that land which, by reason of character alone, might be placed in one of the following six classes, but which, by reason of extra desirable location or other cause, is, in the opinion of the Assessor, of greater valuation than land in general coming under a like character classification; it may be entered on the 1920 assessment roll in a separate classification as "Special":

Cultivated—

Cultivated land shall include all vegetable, orchard, grain, timothy, red top, alfalfa, or any other land of same value as cultivated due to special conditions.

First-class cultivated is land capable of producing 4 or more tons of alfalfa, or 1 ton grain, or 1½ tons timothy per acre.....\$118 and up per acre

Second-class cultivated is land capable of producing 3 to 4 tons alfalfa, or from 1,400 pounds to 1 ton grain, or less than $1\frac{1}{2}$ tons timothy hay per acre..... \$85 and up per acre

Third-class cultivated is land capable of producing from 2 to 3 tons alfalfa, or from 800 to 1,400 pounds grain per acre..... \$66 and up per acre

Fourth-class cultivated is land capable of producing less than 2 tons alfalfa or less than 800 pounds grain per acre..... \$46 and up per acre

Wild Hay or Meadow—

First-class meadow is land capable of producing 1 or more tons to the acre..... \$39 and up per acre

Second-class meadow is land capable of producing from $\frac{3}{4}$ to 1 ton per acre..... \$24 and up per acre

Pasture—

First class \$39 and up per acre

Second class \$26 and up per acre

Third class \$14 and up per acre

Fourth class \$9 and up per acre

Arable—

First-class arable land shall be construed to mean land under fence and with water right..... \$19 and up per acre

Second class \$14 and up per acre

Third class \$9 and up per acre

Fourth class \$4 and up per acre

Grazing—

First class \$20 and up per acre

Second class \$13 and up per acre

Third class \$7 and up per acre

Fourth class \$4 and up per acre

Fifth class \$3 and up per acre

Mountain—

One class only \$2 and up per acre

NOTE—The figures covering the value of land per acre shown above are to be considered as minimum values, below which lands shall not be listed on the rolls. In addition thereto the Assessor retains full power, and is directed to exercise his discretion in bringing the figures "up" to such higher basis as will fairly measure the actual or full cash value of the property to be assessed as a completed whole. Further, all such assessments shall be subject to equalization as provided by law by the appropriate County and State Boards.

RECOMMENDATION MADE BY STATE BOARD OF EQUALIZATION

That each and every county in the State, where not supplied, secure, through its proper officials, from the office of the State Engineer, at Carson City, Nevada, culture maps to be provided the Assessor's office and to be used by said Assessor in assessing land and water rights in his county.

After a lengthy discussion, and upon motion duly made and seconded, the foregoing land classification for assessment purposes in 1920 was adopted by the Board by the following vote:

AYES—Commissioners Shaughnessy, McGill, Gillson; Auditor O'Leary, Clark County; Assessors Ingalls, Esmeralda County; Wheeler, Lincoln County; Dimock, Mineral County; Bateman, Nye County; Stern, Ormsby County; Hurley, Storey County; Hayes, Washoe County; Miles, White Pine County—12.

NAYS—Commissioner Rogers; Assessors Morton, Churchill County; Neilson,

Douglas County; Weathers, Elko County; Organ, Humboldt County; Adams, Lander County; Lothrop, Lyon County; Jurgenson, Pershing County—8.

Passing the vote—Assessor Hooper, Eureka County.

Absent—Chairman Boyle; Commissioners Lockman and Reinhart—3.

The Committee on Live Stock made the following recommendations:

Strike from the assessment of E. J. Thacker, tax-roll Pershing County, 335 head of cattle at \$38 per head, or a total of \$12,730.

Increase the assessment of Paul Murandeborde, tax-roll Pershing County, 4,900 sheep at \$9, \$43,200; 2 work mules, \$180; 2 pack mules, \$50; Reo truck, \$400; or a total increase in said assessment of \$43,830.

Strike from the assessment of LaBorde Brothers, tax-roll Lander County, 5,000 sheep at \$9 per head, or a total of \$45,000.

Strike from the assessment of Joe Savat, tax-roll Elko County, 100 stock cattle at \$38 per head, or \$3,800.

Strike from assessment of Freeland Lytle, tax-roll Lincoln County, 50 stock cattle at \$38 per head, or \$1,900.

Add to the assessment of the Geyser Land and Cattle Company, tax-roll Lincoln County, 1,000 head of sheep at \$9 per head, or \$9,000.

Strike from the assessment of the Antelope Valley Land and Cattle Company, tax-roll Churchill County, 1,000 head of cattle at \$38 per head, or \$38,000.

Upon motion duly made, seconded and carried, the foregoing changes were ordered made on the tax-rolls of the counties named.

Assessor Lothrop of Lyon County requested the following changes in the assessment of the arable land in his county be made, privilege having heretofore been granted said Assessor to make the changes:

First-class arable reduced from.....\$30 per acre to \$19 per acre

Second-class arable reduced from..... 20 per acre to 14 per acre

Third-class arable reduced from..... 10 per acre to 9 per acre

A total reduction in the assessment of said lands of \$144,830.

On motion duly made, seconded and carried, the Assessor of Lyon County was allowed to make the changes as requested.

Assessor Morton of Churchill County, having heretofore been granted the privilege of making changes in the assessment of the lands in his county, presented the following schedule, and asked that the same be granted by the Board:

First-class pasture be increased from.....\$30 per acre to \$39 per acre

Second-class pasture be increased from..... 20 per acre to 26 per acre

Third-class pasture be increased from..... 11 per acre to 14 per acre

Fourth-class pasture be increased from..... 7 per acre to 9 per acre

On motion duly made, seconded and carried, the foregoing changes were ordered made on the tax-roll of Churchill County by the Board.

Assessor Jurgenson of Pershing County, having heretofore been granted the privilege of making changes in the assessment of the lands in his county for equalization purposes, presented the following schedule for the consideration of the Board:

First-class pasture increased from.....\$30 per acre to \$39 per acre

Second-class pasture increased from..... 20 per acre to 26 per acre

Third-class pasture increased from..... 11 per acre to 14 per acre

Fourth-class pasture increased from..... 7 per acre to 9 per acre

On motion duly made, seconded and carried, the foregoing schedule was adopted and the changes ordered by the Board.

On motion duly made, seconded and carried, the request of the Central Pacific Railway for a reduction in the assessment of their lands in Churchill County was denied.

The Committee on Business submitted the following schedule for the assessment of merchandise stocks in 1920:

The last previous inventory shall be taken as the basis of valuation, provided the inventory was taken within six (6) months prior to the time of assessment, and a deduction of fifteen per cent (15%) from the inventory value shall be allowed for depreciation.

Under this rule a stock of merchandise showing an inventory value of \$10,000 would have a depreciated value of \$8,500 for assessment.

In the application of this rule, it is the duty of Assessors to demand proper inventories of merchandise stocks from the owners, and in case of refusal, failure or neglect on the part of said owners to furnish the same, Assessors will make an arbitrary assessment as provided by law.

After discussion and on motion duly made, seconded and carried, the foregoing schedule was adopted by the Board.

The Committee on Business submitted the following schedule for the assessment of motor-driven vehicles in 1920:

The assessed valuation of motor-driven vehicles is determined by applying the following percentage factors to price of machine as printed in the pamphlet:

1920 and Advanced Model.....	100% of cost price
1919 Model	90% of list price
1918 Model	80% of list price
1917 Model	65% of list price
1916 Model	50% of list price

By resolution of the State Board of Equalization motor vehicles of older models than 1916 are to be left to Assessors for valuation; and Assessors are instructed to list all motor vehicles with name of car, horsepower, and year made.

In the event of an owner trading a used car, upon which the taxes have been paid for the current year, for a new car, which is also assessed to said owner, the Assessor shall allow the owner a reduction in the assessment value to correspond with the taxes paid upon the used car; provided the owner furnishes the Assessor with the name, address, and such other information required, of the purchaser of the used car.

On motion duly made, seconded and carried, the foregoing schedule was adopted by the Board.

There being no further business to come before the meeting at this time, on motion duly made, seconded and carried, the State Board of Equalization for 1919 adjourned *sine die*.

MINUTES OF THE NEVADA TAX COMMISSION

MONDAY, OCTOBER 20, 1919

Meeting called to order by Hon. Emmet D. Boyle, Chairman.

Present—Chairman Boyle; J. F. Shaughnessy, Commissioner; W. N. McGill, Commissioner; P. Y. Gillson, Commissioner; F. W. Lockman, Commissioner; Moses Reinhart, Commissioner; Shober J. Rogers, Commissioner; F. N. Fletcher, Secretary.

Mr. Walter J. Harris, Vice-president and Cashier of the Farmers and Merchants National Bank, appeared and protested against the valuation placed against said bank by the State Board of Equalization for assessment purposes for the year 1919. The valuation was \$207,000. Mr. Harris requested that he be allowed to file an amended report of the above-named bank, which request was granted. Mr. Harris stated that the market value of the stock of said bank was not more than \$110 per share, and upon that market value he desired the assessment valuation placed. After further discussion the case was taken under consideration.

Mr. Geo. H. Taylor, Cashier of the Washoe County Bank, appeared before the Commission and protested against the valuation placed on the above-named bank by the State Board of Equalization, which valuation was \$585,000. Mr. Taylor requested a reduction in said assessed valuation on the ground that the true market value of the bank stock was not to exceed \$122 per share. After further discussion the case was taken under advisement.

Chairman Boyle informed the Commission that the question of deducting "construction costs" from the gross yield to find the net proceeds of mines has been before the Commission for several years and had never been legally decided; that it had been agreed with the Mine Operators' Association that the Tonopah Extension Mining Company should institute a friendly test suit to settle this question. Thereupon, the following resolution was submitted and unanimously adopted:

Resolved, That the Attorney-General be called upon by the Tax Commission to maintain the State's position in any and all suits instituted by any mining company or the Mine Operators' Association brought to test the question of construction costs being considered an offset deduction against the gross yield and all other questions involved; be it further

Resolved, That a stipulation be entered into embodying all these questions between the Attorney-General and attorneys for the mining company or Mine Operators' Association, in order to avoid a multiplicity of suits.

The Henderson Banking Company was cited to appear and show cause why the assessed valuation of said company should not be increased from \$162,000 to \$180,000.

Mr. M. D. Fairchild, Cashier of the Stockgrowers and Ranchers Bank, appeared in behalf of said bank and requested that the assessed valuation of the same be reduced from \$90,000, the valuation placed on said banking institution by the State Board of Equalization, to \$56,000, contending that the valuation placed on said bank by the said State Board was excessive. After discussion the case was taken under advisement.

Hon. Geo. B. Thatcher appeared before the Commission and stated he wished it to appear in the record that Hoyt, Norcross, Thatcher, Woodburn & Henley; Cheney, Downer, Price & Hawkins, and Platt & Sanford appeared in behalf of clients set forth in protests which he read to the Commission against the horizontal increase of 18% on all privately owned lands and 20% on country improvements placed on said properties by the State Board of Equalization. Mr. Thatcher stated that these protests were signed by every land and livestock corporation in the State and by many private individuals. A lengthy discussion was entered into by Mr. Thatcher to show that the increases ordered by the State Board of Equalization were illegal.

Mr. Warren C. Noteware stated he wished his name to appear of record as representing certain taxpayers whose names were set forth in said protests.

At the conclusion of the above hearing, a recess was taken by the Commission until Tuesday, October, 21, 1919, at 10 a. m.

TUESDAY, OCTOBER 21, 1919

Meeting called to order by Chairman Boyle.

All members of the Commission present.

Mr. C. J. Hall, Tax Agent of the Bell Telephone Company, appeared before the Commission in behalf of said company, having been cited to appear and show cause why the assessed value of that company's property in Nevada should not be increased. Mr. Hall made a full statement of the property owned by the company in Nevada and the business transacted in 1918, at the conclusion of which the case was taken under advisement.

The Commission entered into a further discussion of the horizontal increases of 18% on privately owned lands and 20% on country improvements placed thereon by the State Board of Equalization.

Mr. H. W. Hobbs, Assistant Tax Attorney for the Central Pacific Railway, appeared before the Commission and requested that the assessed valuation of said company's railroad lands in Churchill County be reduced from \$919,875, as placed thereon by the Assessor of the said county, to \$492,649. Mr. Hobbs stated that the company he represented had refused to pay taxes assessed on said lands since 1914 and that the matter was in litigation in the United States Circuit Court.

At the conclusion of the hearing the Commission denied the request of Mr. Hobbs.

Mr. G. H. Chester, of the Freeman Ranching Company of Churchill County appeared before the Commission and protested against the assessment placed on the lands of the above-named company, and requested that 3,020 acres of land assessed at \$11 per acre be reclassified as third-class grazing and be assessed at \$5 per acre. After discussion the case was taken under advisement.

Hon. Geo. B. Thatcher, of the law firm of Hoyt, Norcross, Thatcher, Woodburn & Henley; Hon. Prince Hawkins of the law firm of Cheney, Price & Hawkins, and Hon. Geo. L. Sanford of the law firm of Platt & Sanford, appeared in behalf of protestants whose names are set forth in protests filed with this Commission, and again petitioned the Commission to rescind the action of the State Board of Equalization

placing an 18% horizontal increase on privately owned lands and 20% increase on country improvements. The matter was discussed at length, and taken under advisement.

On motion duly made, seconded and carried, the Commission recessed until Wednesday, October 22, 1919, at 10 a. m.

WEDNESDAY, OCTOBER 22, 1919

Meeting called to order by J. F. Shaughnessy, Acting Chairman.

All members of the Commission present with the exception of Chairman Boyle and Moses Reinhart, Commissioner.

Mr. F. E. Murphy, Tax Attorney for the Virginia and Truckee Railway, appeared before the Commission in behalf of said company and requested that the full cash valuation of said company for taxation purposes be reduced from \$1,000,000, as it was placed by the Tax Commission, to \$600,000. Mr. Murphy submitted a statement showing the earnings and expenditures of said company covering a period of years. After discussion the case was taken under advisement.

Mr. Wm. M. Kearney appeared before the Commission and requested a reduction in the assessed valuation of certain contract land in Lyon County which he had purchased from the Central Pacific Railway. The total acreage is 637. Mr. Kearney stated that he had paid \$5 per acre for half said acreage and \$5.25 for the balance. The land was placed on the tax-roll by the Assessor of said county at \$10 per acre, which Mr. Kearney claimed was excessive. After discussion the case was taken under advisement.

Mr. J. W. Dorsey, attorney, and Mr. Griswold, attorney, appeared before the Commission in behalf of the heirs of the Dunphy Estate and requested a reduction in the assessed valuation of the lands belonging to and appearing on the tax-roll of Eureka County in the names of the heirs of said estate. A request was also made of the Commission to classify said lands. After discussion the case was taken under advisement.

Mr. Chas. G. Patrick, General Manager of the Goldfield Consolidated Water Company, having appeared before the State Board of Equalization and petitioned said Board for a reduction in the assessed valuation of said company's property in Esmeralda County from \$90,000 to \$60,000, and said State Board, through Assessor Ingalls of Esmeralda County, having declined to take action and referred the matter to the Tax Commission, after consideration of the case, on motion duly made, seconded and carried, the assessment of said company's property in Esmeralda County was ordered to stand as placed on the tax-roll.

A statement signed by Mr. A. S. Cooper, Assistant Treasurer of the Nevada-California Power Company, was read by the Secretary. The matter of the assessment of this company being in litigation in the court the said statement was filed and no action taken on the assessment of said company's property.

The Nevada Power Company of Jarbidge, Elko County, having filed a statement with the Commission, the same was read by the Secretary. It stated that the total mileage of said company in Nevada was 71.2 miles and its net earnings \$4,514. After discussion, and on motion duly made, seconded and carried, the assessed valuation of this company's property in Nevada was placed at \$27,000, an increase of \$9,000 over the assessment in 1918.

On motion duly made, seconded and carried, a recess was taken until Thursday, October 23, 1919, at the hour of 10 a. m.

THURSDAY, OCTOBER 23, 1919

Meeting called to order by Chairman Boyle.

All members of the Commission present.

Mr. Ira L. Winters of Ormsby County appeared before the Commission and made a statement concerning the assessment of lands purchased by him from the E. D. Sweeney Estate, stating that said property was assessed in 1918 at \$900, and had been assessed at \$2,500. Mr. Winters requested that the assessed valuation of said lands be reduced. After discussion the matter was taken under advisement.

Mr. C. O. Whittemore, attorney for the Bullfrog and Goldfield Railroad, appeared before the Commission, and petitioned for a substantial reduction in the assessed valuation of said company's property in Esmeralda and Nye Counties, showing that said company had been operating at a loss, there being a deficit of \$10,161.43 for the year ending July 31, 1919. After discussion the case was taken under advisement.

Mr. Hugh L. Thomas, Superintendent of the Utah, Nevada and Idaho Telephone Company, appeared before the Commission and submitted a statement showing the mileage of said company in various counties in the State amounting to 439 miles, making the total mileage in the State of 739 miles. The Commission placed a full cash value of \$63 per mile on the same, making the total valuation \$57,582, or an increase of \$18,747 over the year 1918. On motion duly made, seconded and carried, the total mileage of the company in Nevada was placed at 739, with an assessed valuation of \$57,582.

On motion duly made, seconded and carried the assessment of the Nevada Telephone and Signal Company was placed at \$2,233, with six miles in Churchill County assessed at a valuation of \$340, and 48 miles in Lyon County assessed at a valuation of \$1,893.

Mr. Sam. W. Belford appeared before the Commission in behalf of the McGill National Bank and Copper National Bank of White Pine County, and requested the Commission to place the assessments of said bank at the same figures as in 1918. After a full and complete statement, Mr. Belford stated that any fair valuation would be acceptable. The State Board of Equalization increased the assessed valuation of the Copper National Bank from \$60,000 to \$67,500, and the McGill National Bank from \$25,000 to \$27,000. After discussion the cases were taken under advisement.

On motion duly made, seconded and carried, the Commission recessed until Saturday, October 25, 1919, at 10 a. m.

SATURDAY, OCTOBER 25, 1919

Meeting called to order by Chairman Boyle.

All members of the Commission present.

Mr. William Doyle, representing the John S. Cook & Company of Goldfield, appeared before the Commission and petitioned for a reduction in the assessed valuation of said bank from \$65,000, as placed thereon by the State Board of Equalization, to \$45,000. Mr. Doyle requesting that the same rule be applied to the John S. Cook and

Company Bank in arriving at the assessment as applied to all other banks in the State. After discussion, and on motion duly made, seconded and carried, the assessed valuation of the above-named bank was placed at \$45,000.

Mr. William Doyle appeared in behalf of the Tonopah Banking Corporation and requested that the assessed valuation of said bank be reduced from \$45,000, as placed thereon by the State Board of Equalization, to \$35,000. After discussion, and on motion duly made, seconded and carried, the assessed valuation of said bank was placed at \$35,000.

Mr. F. G. Waterhouse, General Manager of the Nevada Telephone and Telegraph Company, appeared before the Commission in behalf of said company and requested that the assessed valuation be reduced. The property of said company is located in Esmeralda and Nye Counties. After discussion, and on motion duly made, seconded and carried, said request was denied.

The Commission entered into a further discussion of the horizontal increase of 18% placed on lands by the State Board of Equalization and 20% on country improvements. Commissioner Rogers moved that the action of the State Board of Equalization placing a horizontal increase of 18% on all privately owned lands in the State and a horizontal increase of 20% on all country improvements be rescinded by the Tax Commission. The motion was seconded by Commissioner McGill, and carried by the following vote:

AYES—Chairman Boyle; Commissioners McGill, Reinhart, Lockman, Rogers—5.

NAYS—Commissioners Shaughnessy and Gillson—2.

On motion duly made, seconded and carried the assessed valuations of the following named banks were reduced to the figures named:

McGill National Bank.....	\$20,250
Copper National Bank.....	50,625
Ely National Bank.....	16,875
Stockgrowers & Ranchers Bank.....	75,000
Farmers & Merchants Bank.....	201,600
Lyon County Bank.....	65,333

On motion duly made, seconded and carried the Commission recessed until Monday, October, 27, 1919, at 10 a. m.

MONDAY, OCTOBER 27, 1919

Meeting called to order by Chairman Boyle.

All members of the Commission present.

On motion duly made, seconded and carried, the full cash value of the Pitt Mill and Elevator Company of Pershing County was placed at \$40,000, the assessed valuation of 90% thereof, or \$36,000. This was an increase of \$28,131 over the assessment placed on said company.

On motion duly made, seconded and carried, the assessed valuation of the Henderson Banking Company was increased from \$162,000 to \$180,000.

On motion duly made, seconded and carried, the full cash valuation of the Bell Telephone Company's property in Nevada was placed at \$790,000, and the assessed valuation 90% thereof, or \$711,000.

On motion duly made, seconded and carried, the assessment of the

Minerva Tungsten Mines Company in White Pine County was reduced from \$55,799 to \$30,000.

On motion duly made, seconded and carried, the lands of Wm. M. Kearney in Lyon County were reduced in assessed valuation to an average of \$6 per acre.

On motion duly made, seconded and carried, the lands belonging to Ira Winters in Ormsby County were reduced from an assessed valuation of \$2,500 to \$1,650.

On motion duly made, seconded and carried, the request of the Freeman Ranching Company of Churchill for a reduction in the assessed valuation of 3,020 acres at \$11 to \$5 per acre, was denied.

On motion duly made, seconded and carried the assessed valuation of the Farmers & Merchants Bank was reduced from \$201,600, as formerly placed by the Commission, to \$192,600.

On motion duly made, seconded and carried, the full cash valuation of the Virginia & Truckee Railway Company's property was placed at \$900,000, or a reduction of 10%, and the assessed valuation at 90% of that amount, or \$810,000.

On motion duly made, seconded and carried, the assessed valuation of the Bullfrog and Goldfield Railroad was reduced from \$341,365 to \$285,000.

On motion duly made, seconded and carried, the Secretary was instructed to communicate with the attorneys for the heirs of the Dunphy Estate stating if they will allow the assessment of the lands owned by the heirs in Eureka County stand as they are assessed for 1919 that the Tax Commission will, at once, appoint an appraiser to go to Eureka County for the purpose of classifying said lands and placing a valuation thereon, and if acceptable to the State and the owners of said lands that the same be the basis for the assessment of said lands in 1920.

On motion duly made, seconded and carried, the assessment factor for 1920 was placed at full cash value, or 100%, as recommended and adopted by the State Board of Equalization.

On motion duly made, seconded and carried, the lands in Churchill, Douglas, and Pershing Counties, which were equalized by the State Board of Equalization, were ordered to stand on the tax-rolls as formerly ordered.

On motion duly made, seconded and carried, the following mining companies were allowed exemptions on patented mining claims, affidavits of labor in proper form having been filed with this Commission.

Pacific Consolidated Mining and Smelting Company, Elko County, six (6) patented mining claims.

Zulu patented mining claim. Eureka County.

Manhattan Verde Mining Company (reorganized) Nye County, one (1) patented mining claim.

Ploche Mines Company, Lincoln County, three (3) patented mining claims.

West Mining Company, Nye County, three (3) patented mining claims.

Mercury Mining Company, Nye County, ten (10) patented mining claims.

Nevada New Mines Company, Mineral County, seventeen (17) patented mining claims.

Nevada United Mining Company, Churchill County, thirty (30) patented mining claims.

On motion duly made, seconded and carried, one hundred (100) acres of land belonging to A. J. Pedroli in Ormsby County was ordered reclassified as follows: Seventy acres third-class pasture, at \$11 per acre, and thirty acres, third-class grazing, at \$5 per acre.

On motion duly made, seconded and carried, and in accordance with an opinion of the Attorney-General, all lands in Churchill County belonging to the Douglas-Renfro Land Company, were ordered on the tax-roll of said county for 1918 and said company ordered to pay taxes thereon. All of the said lands were inadvertently left off of the tax-roll for 1918 by the Assessor of said county.

On motion duly made, seconded and carried, the Phillipine Vegetable Oil Company was ordered on the tax-rolls of various counties at full cash value of \$5,353, and the Secretary instructed to apportion said valuation to the counties wherein the property of said company is stationed.

There being no further business to come before the meeting, on motion duly made, seconded and carried, the Commission recessed subject to the call of the Chair.

MONDAY, JANUARY 12, 1920

Meeting called to order by Hon. Emmet D. Boyle, Chairman.

Present—Chairman Boyle; Commissioners J. F. Shaughnessy, P. Y. Gillson, F. W. Lockman, Moses Reinhart, and F. N. Fletcher, Secretary.

Absent—Commissioners W. N. McGill and S. J. Rogers.

In the matter of the assessment of railroads and public utilities for the year 1920, after discussion and on motion duly made, seconded and carried, the Secretary was instructed to make up the valuations and assessments of all railroads and public utilities in the usual pamphlet form and on an assessment basis of 100%, or full cash value.

The financial statement of the Tax Commission for 1919 was presented and appears on the last page of this report.

On motion duly made, seconded and carried, the Secretary was directed to arrange a conference between the representatives of the mining industry, the Governor, Attorney-General and members of the Tax Commission for the purpose of discussing whether or not plant construction or plant depreciation should be allowed as an offset in arriving at the net proceeds of mines for taxation purposes.

The subject of taxation of auto-truck transportation companies as public utilities was discussed and the Secretary was instructed to make up and send out blank forms to all such companies operating under certificates of public convenience issued by the Public Service Commission.

The report of H. S. Pohe, Field Agent for the Commission, covering the work accomplished by him during the year 1919, was read and accepted and ordered placed on file in the office of the Commission.

The classification, valuation and assessment of land for the year 1920 and the schedule adopted by the State Board of Equalization at its meeting in 1919 were discussed at length, and on motion duly made, seconded and carried, the schedule as recommended by the State Board was adopted. (This schedule appears in the minutes of the State Board of Equalization of this report.)

The classification and valuation of livestock for 1920 as recommended

by the State Board of Equalization at its meeting in 1919, were, on motion duly made, seconded and carried, adopted for the year 1920. (This schedule appears in the proceedings of the State Board of Equalization.)

The method of assessing merchandise stocks in 1920, as recommended by the State Board of Equalization at its meeting in 1919, was, on motion duly made, seconded and carried, adopted. (This schedule appears in the proceedings of the State Board of Equalization.)

The method of assessing motor-driven vehicles for 1920, as recommended by the State Board of Equalization at its meeting in 1919, was, upon motion duly made, seconded and carried, adopted. (This schedule appears in the proceedings of the State Board of Equalization.)

On motion duly made, seconded and carried, the following resolution was adopted:

Resolved, That the Secretary of this Commission take up with the land and livestock owners, during their session in Reno, commencing on the 22d of January, the question of their appointing a committee to confer with this Commission on the assessment of land and livestock in this State, and such other questions with regard to taxation as may come up.

There being no further business to come before the meeting the Commission recessed subject to the call of the Chair.

FRIDAY, FEBRUARY 27, 1920

Meeting called to order by Hon. Emmet D. Boyle, Chairman.

Present—Chairman Boyle; Commissioners J. F. Shaughnessy, W. N. McGill, P. Y. Gillson, S. J. Rogers, and F. N. Fletcher, Secretary.

After discussion, and on motion duly made, seconded and carried, the following resolution was presented and unanimously adopted;

WHEREAS, The Nevada Tax Commission did on October 20, 1919, rescind the action of the State Board of Equalization regarding valuation increases upon which the 1919 recommendations for the classification and assessment of lands for the year 1920 were predicated;

WHEREAS, The Nevada Tax Commission did on January 12, 1920, issue a bulletin setting forth the action of the State Board of Equalization and directing the use of the plan of classification and assessment adopted by the State Board of Equalization for the year 1920, the same being Tax Commission Bulletin No. 22; therefore, be it

Resolved, That the Secretary of the Nevada Tax Commission be directed to list this resolution in full in a bulletin advising the various Assessors of the State of Nevada of the rescinding of the order of January 12, 1920, in so far as the same relates to valuations on lands as distinguished from classification adopted at said meeting; and further advising said Assessors that, in conformity with the law, the assessment of lands for the year 1920 is left to the discretion of the County Assessors, subject to equalization at the meeting of the State Board of Equalization in August, 1920, and the meeting of the Nevada Tax Commission in October, 1920, as provided by law; and that the classification of lands regularly adopted by the State Board of Equalization, as set forth in said Bulletin No. 22, be adhered to subject to review by the State Board of Equalization and the Nevada Tax Commission.

There being no further business to come before the meeting, on motion duly made, seconded and carried, the Commission recessed subject to the call of the Chair.

MINUTES OF THE STATE BOARD OF EQUALIZATION

MONDAY, AUGUST 18, 1920

Meeting called to order by Governor Emmet D. Boyle, Chairman.

Present—Chairman Boyle; J. F. Shaughnessy, Commissioner; F. N. Fletcher, Secretary; H. A. Morton, Assessor, Churchill County; D. J. O'Leary, Auditor, Clark County; Chris Neilsen, Assessor, Douglas County; W. M. Weathers, Assessor, Elko County; R. E. Lothrop, Assessor, Lyon County; J. H. Stern, Assessor, Ormsby County; John Hayes, Assessor, Washoe County.

Absent—W. N. McGill, Commissioner; P. Y. Gillson, Commissioner, F. W. Lockman, Commissioner; S. J. Rogers, Commissioner; Moses Reinhart, Commissioner; W. A. Ingalls, Assessor, Esmeralda County; W. J. Hooper, Assessor, Eureka County; A. E. Organ, Assessor, Humboldt County; W. G. Adams, Assessor, Lander County; J. B. Wheeler, Assessor, Lincoln County; F. B. Balzar, Assessor, Mineral County; John Barrier, Assessor, Nye County; J. A. Jurgenson, Assessor, Pershing County; T. J. Hurley, Assessor, Storey County; J. F. Miles, Assessor, White Pine County.

It being shown that the segregations of the tax-rolls would not be received from the printer, after discussion it was moved, seconded and carried, that the Board recess to meet at the call of the Chair.

MONDAY, AUGUST 23, 1920

Meeting called to order by Governor Emmet D. Boyle, Chairman.

Present—Chairman Boyle; P. Y. Gillson, Commissioner; F. W. Lockman, Commissioner; S. J. Rogers, Commissioner; F. N. Fletcher, Secretary; H. A. Morton, Assessor, Churchill County; D. J. O'Leary, Auditor, Clark County; Chris Neilsen, Assessor, Douglas County; W. J. Hooper, Assessor, Eureka County; A. E. Organ, Assessor, Humboldt County; W. G. Adams, Assessor, Lander County; J. B. Wheeler, Assessor, Lincoln County; R. E. Lothrop, Assessor, Lyon County; B. M. Bateman, Deputy Assessor, Nye County; J. H. Stern, Assessor, Ormsby County; J. A. Jurgenson, Assessor, Pershing County; Thos. J. Hurley, Assessor, Storey County; John Hayes, Assessor, Washoe County; J. F. Miles, Assessor, White Pine County.

Absent—J. F. Shaughnessy, Commissioner; W. N. McGill, Commissioner; Moses Reinhart, Commissioner; W. M. Weathers, Assessor, Elko County; W. A. Ingalls, Assessor, Esmeralda County; F. B. Balzar, Assessor, Mineral County.

The Chairman stated that the first order of business would be the appointment of committees to handle the business of the State Board of Equalization.

The following were appointed on committees:

Land—Commissioner Rogers, and Assessors Weathers, Jurgenson, Lothrop, and Neilsen.

Livestock—Commissioner McGill, and Assessors Organ, Hooper, Wheeler, and Hayes.

Mining—Commissioner Lockman, and Assessors Miles, O'Leary, Hurley, and Bateman.

Banking—Commissioner Reinhart, and Assessors Adams, Stern, O'Leary, and Hayes.

Public Utilities—Commissioner Shaughnessy, and Assessors Morton, Adams, Stern, and Organ.

Business—Commissioner Gillson, and Assessors Morton, Hurley, Stern, and Bateman.

Chairman Boyle briefly reviewed the action of the Tax Commission in rescinding the orders of the State Board of Equalization in 1919.

which added a horizontal increase of 18% to the valuation of lands and 20% on all country improvements, and explained the arrangement entered into with the Nevada Livestock Association whereby a general appraisal of property valuations was to be made through cooperation with all property interests in the State, but that the effort to secure general cooperation had failed, and that the owners of land and live stock had been working to secure data to present to the State Board for its consideration. He called Mr. Warren C. Noteware of the land-tax division of the Nevada Livestock Association to explain the work being done by that organization. Mr. Noteware stated that the Nevada Livestock Association represented 80% of the land and livestock owners in the State; that said tax division was gathering data on the subject of assessment and taxation which it would place before the State Board for its use; that it desired to have a committee of said Association meet with the Committee on Land and Live Stock of the State Board.

On motion duly made, seconded and carried, an invitation was extended to the Tax Committee of the Livestock Association to meet with the Committee on Land and Live Stock of the State Board.

Governor Boyle stated that the Secretary of the Mine Operators' Association desired to meet with the State Board of Equalization to discuss pending litigation concerning the net proceeds of mines.

On motion duly made, seconded and carried, said Secretary was invited to meet with the Board.

After further discussion the Board recessed until Tuesday, August 24, 1920, at 10 a. m.

TUESDAY, AUGUST 24, 1920

Meeting called to order by Chairman Boyle.

Present—Chairman Boyle; P. Y. Gillson, Commissioner; F. W. Lockman, Commissioner; S. J. Rogers, Commissioner; F. N. Fletcher, Secretary; H. A. Morton, Assessor, Churchill County; D. J. O'Leary, Auditor, Clark County; Chris Neilsen, Assessor, Douglas County; W. M. Weathers, Assessor, Elko County; W. J. Hooper, Assessor, Eureka County; A. E. Organ, Assessor, Humboldt County; W. G. Adams, Assessor, Lander County; J. B. Wheeler, Assessor, Lincoln County; R. E. Lothrop, Assessor, Lyon County; B. M. Bateman, Deputy Assessor, Nye County; J. H. Stern, Assessor, Ormsby County; J. A. Jurgenson, Assessor, Pershing County; T. J. Hurley, Assessor, Storey County; John Hayes, Assessor, Washoe County; J. F. Miles, Assessor, White Pine County.

Absent—J. F. Shaughnessy, Commissioner; W. N. McGill, Commissioner; Moses Reinhardt, Commissioner; W. A. Ingalls, Assessor, Esmeralda County; F. B. Balzar, Assessor, Mineral County.

After discussion a recess was taken until Wednesday, August 25, 1920, in order that the committees might organize and investigate matters pertaining to their particular work.

WEDNESDAY, AUGUST 25, 1920

Meeting called to order by Chairman Boyle.

Present—Chairman Boyle; F. W. Lockman, Commissioner; S. J. Rogers, Commissioner; P. Y. Gillson, Commissioner; F. N. Fletcher, Secretary; H. A. Morton, Assessor, Churchill County; D. J. O'Leary, Auditor, Clark County; Chris Neilsen, Assessor, Douglas County; W. M. Weathers, Assessor, Elko County; W. J. Hooper, Assessor, Eureka County; A. E. Organ, Assessor, Humboldt County; W. G. Adams, Assessor, Lander County; J. B. Wheeler, Assessor, Lincoln County; R. E. Lothrop, Assessor, Lyon County; B. M. Bateman, Deputy Assessor, Nye County; J. H. Stern, Assessor, Ormsby County; T. J. Hurley,

Assessor, Storey County; J. A. Jurgenson, Assessor, Pershing County; John Hayes, Assessor, Washoe County; J. F. Miles, Assessor, White Pine County.

Absent—J. F. Shaughnessy, Commissioner; W. N. McGill, Commissioner; M. Reinhart, Commissioner; W. A. Ingalls, Assessor, Esmeralda County; F. B. Balzar, Assessor, Mineral County.

On motion duly made, seconded and carried, a committee was appointed to consider and make recommendations as to a uniform tax-roll. The Chair appointed the following on said Committee: Assessors Stern, Jurgenson, and Miles.

Mr. Morley Griswold, attorney, and Captain X. Rodwell Meyer, manager, of the Dunphy Estate, appeared before the Board and requested to have a meeting with the Tax Commission for the purpose of considering the report of Commissioner S. J. Rogers on the classification and valuation of the Dunphy lands in Eureka and Lander Counties, whereupon the Tax Commission was called to order with Chairman Boyle and Commissioners Shaughnessy, Gillson, Lockman, and Rogers present. The members of the State Board of Equalization also remained during the discussion. Mr. Griswold entered into a lengthy discussion of the pending litigation between the owners of the Dunphy lands in Eureka and Lander Counties, and requested that the report of Mr. Rogers be taken up for consideration. The report of Commissioner S. J. Rogers was read by the Secretary.

On motion duly made, seconded and carried, the report of Commissioner Rogers was accepted and placed on file.

After discussion the Tax Commission adjourned and the State Board of Equalization was called to order. Mr. Griswold made a statement concerning the assessment of the Dunphy lands in Eureka and Lander Counties for the year 1920, claiming that there had been no classification of the lands in Eureka County and that in both Eureka and Lander Counties the assessments were altogether too high. Captain Meyer followed with a statement concerning valuations of said property. After discussion, and on motion duly made, seconded and carried, it was ordered that a committee of three, consisting of Commissioner Rogers and Assessors Hooper of Eureka and Adams of Lander Counties, confer together and appoint an appraiser to go on the Dunphy lands, appraise and value the same and report his findings to the Tax Commission at its meeting in October.

Mr. Henry M. Rives, Secretary of the Mine Operators' Association, appeared before the Board and requested that he and other members of his Association be allowed to appear before the Board on Friday following. The request was granted.

On motion duly made, seconded and carried, the Board recessed until Friday, August 27, 1920, at 10 a. m.

FRIDAY, AUGUST 27, 1920

Meeting called to order by Chairman Boyle.

All members of the State Board of Equalization present with the exception of Commissioners Shaughnessy and Lockman, and Assessors Ingalls of Esmeralda and Balzar of Mineral counties.

The entire session was taken up in the discussion of the assessment and valuation of lands and other property in the State.

On motion duly made, seconded and carried, the Board recessed until Monday, August 30, 1920, at 10 a. m.

SPECIAL MEETING OF THE NEVADA TAX COMMISSION

MONDAY, AUGUST 30, 1920

Meeting called to order by Chairman Boyle.

Present—Chairman Boyle; Commissioners J. F. Shaughnessy, S. J. Rogers, M. Reinhart, and F. N. Fletcher, Secretary.

Absent—Commissioners P. Y. Gillson, F. W. Lockman, and W. N. McGill.

The members of the State Board of Equalization remained during the discussion.

A committee of the Mine Operators' Association consisted of J. G. Kirchen, President; Henry M. Rives, Secretary; and Geo. B. Thatcher, attorney. Attorney-General Fowler appeared on behalf of the State. The tentative proposals entered into between the Mine Operators' Association and the Nevada Tax Commission in Reno on February 27, 1920, were read. Mr. Thatcher, in behalf of the Association, stated that the rules governing the assessment of net proceeds of mines were wholly in charge of the Tax Commission; that the important question to be decided is that of plant depreciation. He asked that the Tax Commission lay down rules and regulations to cover depreciation of plant. That the actual cost of the plant should be allowed as a deduction from the gross proceeds, but should be spread over a period of years down to 20% of the cost, and that the cost of milling should be increased each quarter sufficiently to cover amortization. That interest charges on the capital invested should be allowed.

After further discussion, the Tax Commission adjourned subject to the call of the Chair.

MINUTES OF THE STATE BOARD OF EQUALIZATION

TUESDAY, AUGUST 31, 1920

Meeting called to order by Chairman Boyle.

All members of the Board present with the exception of Commissioners Shaughnessy, McGill and Lockman, and the Assessors of Esmeralda and Mineral Counties.

The Secretary called the attention of the Board to the resolution adopted in 1918 by the Board requiring that the personal property tax-rolls from all counties be filed with the Tax Commission, and reported that the rolls from Elko, Esmeralda, Humboldt, Nye, Ormsby, Storey, and White Pine Counties had not been filed. The matter was discussed but no action taken.

The Secretary also reported that the State Controller's report showed that some Assessors reported railroads and public utilities as personal property while others reported the same as real estate. The matter was discussed and it was decided to invite the State Controller to appear before the Board and explain this matter.

On motion duly made, seconded and carried, the Board recessed until Wednesday, September 1, 1920, at 10 a. m.

WEDNESDAY, SEPTEMBER 1, 1920

Meeting called to order by Chairman Boyle.

All members of the Board present with the exception of Commissioners Shaughnessy, Lockman and McGill, and Assessor Ingalls of Esmeralda County.

The Land Committee presented its report for the consideration of the Board, and on motion duly made, seconded and carried, made the following disposition of the various items:

J. H. Clemons was cited to appear to make further showing as to the value of lands owned by the Antelope Valley Land and Cattle Company in Lyon County.

The request of the Union Land and Livestock Company for a reduction in the assessed value of its land in Humboldt County was denied.

The request of Wm. F. Dressler for reduction in the assessed valuation of lands in Lyon County was granted.

Requests of Assessors of Lincoln and Nye Counties granted.

Recommendation striking 554.94 acres from the tax-roll of Churchill County adopted.

Request of J. H. Machlin denied.

Request of H. C. Allen granted.

Request of Hugh Hoch denied.

Request of T. D. Leavitt, Sr., granted.

Recommendations increasing total land assessment in Churchill County by \$97,000; and increasing valuation of all cultivated lands in Washoe County by \$198,487; and decreasing the total land assessment in Lyon County by \$179,290; and in Douglas County by \$126,381. were adopted.

Wm. M. Kearney, attorney, and Frank Garaventa, manager.

appeared before the Board in behalf of the Garaventa Land and Live-stock Company, and requested a reduction in the assessed valuation of that company's property in Lyon County from \$42,388 to \$29,000. The matter was referred to the Land Committee.

The Committee on Live Stock reported, recommending that livestock assessments for 1920 stand as now on the tax-rolls. Recommendation adopted by vote.

On motion duly made, seconded and carried, the Board recessed until 10:30 a. m., Thursday, September 2, 1920.

THURSDAY, SEPTEMBER 2, 1920

Meeting called to order by Hon. Maurice J. Sullivan, Lieutenant and Acting Governor.

All members of the Board present with the exception of Chairman Boyle, Commissioners Shaughnessy and Lockman, and the representatives of Clark and Esmeralda Counties.

The State Bank and Trust Company, through its attorney, Geo. S. Green, and representative, Jas. T. Davis, appeared and presented a statement as to the valuation of its property in Tonopah and requested a reduction in the assessed valuation from \$71,400 to \$41,000. The matter was taken under advisement and referred to the Committee on Business and Town Property.

The Committee on Banks presented its report, which was read by the Secretary, as follows:

Churchill County Bank	\$88,306
Bank of Fallon	50,000
First State Bank of Las Vegas.....	52,000
Douglas County Bank	25,000
Farmers Bank of Carson Valley.....	80,000
Bank of Wells	42,500
First National Bank of Elko.....	130,000
Henderson Banking Company	200,000
John S. Cook & Company.....	50,000
Eureka Bank	10,000
First National Bank of Winnemucca.....	350,000
Winnemucca State Bank and Trust Company.....	110,000
Quinn River Bank	25,000
First National Bank of Lovelock.....	84,000
Lovelock Mercantile Banking Corporation.....	55,000
Horton Banking Company	12,000
Lander County Bank	32,500
Bank of Pioche	27,500
Lyon County Bank	71,200
Mason Valley Bank	36,250
Nevada First National Bank of Tonopah.....	120,000
Tonopah Banking Corporation	50,000
Carson Valley Bank	85,000
Farmers and Merchants National Bank.....	214,000
Reno National Bank.....	700,000
Bank of Nevada Savings & Trust Company.....	120,000
Scheeline Banking & Trust Company.....	150,000
Stockgrowers & Ranchers Bank.....	100,000
Washoe County Bank	600,000
Bank of Sparks	35,000
Copper National Bank	75,000
Ely National Bank	25,000
First National Bank of Ely	50,000
McGill National Bank	25,000

On motion duly made, seconded and carried, the report was received and filed subject to revision.

A written request from Chas. H. Burritt, attorney for the owners in the English Mill Ditch in Washoe County, that the assessment of said ditch be stricken from the tax-roll of said county, was received. The request was denied and matter referred to the Tax Commission for action.

The supplemental report of the Land Committee was presented and read by the Secretary, as follows:

The request of the Garaventa Land and Livestock Company for a reduction of their land assessment from \$41,538 to not to exceed \$29,500 has been considered, and our recommendation is that the request be denied.

Assessor Hayes of Washoe County asks a reduction in the land assessments in said county as follows:

Second-class cultivated from.....	\$98.69 to \$85.00 per acre
Third-class cultivated from	72.21 to 66.00 per acre
Fourth-class cultivated from.....	54.55 to 46.00 per acre

We recommend that the request be denied.

The Assessor of Lander County requests that the assessment on railroad lands in the county be reduced by \$10,000. The purpose of this is to correct a clerical error. We recommend the change be made.

On motion duly made, seconded and carried, the Board recessed until Friday, September 3, 1920, at 10 a. m.

FRIDAY, SEPTEMBER 3, 1920

Meeting called to order by Hon. Maurice J. Sullivan, Lieutenant and Acting Governor.

All members of the Board present with the exception of Chairman Boyle, Commissioners Shaughnessy, Lockman and Reinhart, and the representatives of Clark and Esmeralda Counties.

The Livestock Committee presented its report for the assessment of live stock in 1921, which was read by the Secretary, as follows:

Cattle, including all calves born in 1920.....	\$32.00 per head
Bulls.....	100.00 per head and up
Dairy cows for dairy purposes.....	75.00 per head and up
Work horses, 1,100 lbs. and up.....	90.00 per head and up
Work horses, 1,100 lbs. and less.....	75.00 per head and up
Saddle horses.....	55.00 per head and up
Stock horses.....	Left to Assessor
Stallions.....	200.00 per head and up
Brood mares.....	50.00 per head and up
Work mules.....	90.00 per head and up
Stock mules.....	50.00 per head and up
Jacks.....	200.00 per head and up
Burros.....	10.00 per head and up
Sheep.....	6.00 per head
Bucks.....	10.00 per head
Goats.....	3.50 per head
Hogs (8 months old and over).....	12.00 per head
Pigs (2 to 8 months old).....	4.00 per head
Poultry.....	.50 per head
Turkeys.....	1.00 per head
Ducks.....	.50 per head
Geese.....	1.00 per head
Bees.....	5.00 per stand

Assessment of all other stock left to Assessor.

On motion duly made, seconded and carried, said report was adopted.

The Committee on Live Stock made the following recommendations, which, on motion duly made, seconded and carried, were adopted by the Board.

The assessment of stock cattle belonging to Bliss Brothers of Humboldt County reduced from 3,695 head to 3,445, or a reduction of \$9,250.

The assessment of stock cattle belonging to the Lay Land and Livestock Company of Humboldt County was reduced 200 head, or \$7,600, and a reduction of 600 head of sheep at \$8 per head, or \$4,800, a total reduction of \$12,400.

The Committee on Merchandise presented the following report, which, after being read by the Secretary, on motion duly made, seconded and carried, was adopted:

The following counties show increases and decreases in the assessment of merchandise for 1920:

	<i>Increase</i>	<i>Decrease</i>
Lander County	20,302	
Clark County	8,760	
Douglas County	53,565	
Elko County	34,425	
Esmeralda County		\$2,853
Eureka Counties	18,825	
Humboldt County	12,262	
Lander County	20,302	
Lincoln County	32,840	
Lyon County		5,196
Mineral County	7,955	
Nye County		134,382
Ormsby County		1,190
Pershing County		7,710
Storey County		6,150
Washoe County	69,910	
White Pine County	95,861	

White Pine figures include mine assessments. After deduction of this item merchandise in this county shows a material decrease.

The decrease in Nye County is accounted for, the Assessor having deducted mine merchandise from the roll.

We recommend that the 1920 tax-roll with reference to the assessment of merchandise be accepted without change.

Mr. J. H. Clemons appeared in behalf of the Union Land and Cattle Company, stating that the Pershing County Assessor had placed on the tax-roll 7,000 head of sheep against the said company, when the Union Land and Cattle Company only had 3,700 head of sheep in that county; that in Washoe County the Assessor had a like number on the roll, when there should be not to exceed 3,300 head. After discussion, and on motion duly made, seconded and carried, the matter was placed in the hands of the Assessors of Pershing and Washoe Counties to adjust. After consideration by said Assessors, it was recommended that Pershing County should have assessed to said company, 3,700 head of sheep, and Washoe County 3,300 head of sheep. This recommendation was adopted.

On motion duly made, seconded and carried, and on the recommendation of the Assessors of Eureka and Lander Counties, 1,677 head of sheep at \$8 per head was added to the assessment of the Dunphy Estate in Eureka County, and taken from the assessment of said Estate in Lander County.

The Committee on Business and Town Property presented the following report on automobiles, which, after being read by the Secretary, was adopted by the Board:

The 1919 rolls show the total number of automobiles assessed during that year to have been 6,166, with a total valuation of \$2,631,279, the average value of each machine being \$426. The 1920 rolls show the total number of machines assessed this year to be 6,883, with a valuation of \$3,715,378, having an average value of \$540. The increase in the number of machines is 717. The increase in valuation is \$1,084,090. A total of 10,090 machines have been registered in the Secretary of State's office and 6,883 appear on the rolls, showing a discrepancy on the rolls of 3,207 machines.

We recommend that the State Board of Equalization adopt a resolution advocating all automobiles, freight and passenger lines, operating as common carriers within the State, be placed under the supervision of the Nevada Tax Commission for assessment purposes and treated as common carriers, defined by the Public Service Commission Act, the assessment of which is provided for by section 5 of the Nevada Tax Commission Act.

The Committee on Mines presented the following report, which, after being read by the Secretary, was adopted by the Board:

Rochester Combine Mines, Pershing County, a reduction in assessment of from \$75,000 to \$50,000.

R. R. Hillman, Storey County, a reduction in assessment of mining property from \$19,250 to \$12,250.

Nevada Austin Mines Company, Lander County, a reduction in assessment from \$16,000 to \$5,000.

Cortez Consolidated Mining Company, assessment of property in Lander County, reduced \$3,000.

Silgold Mining Company, increase assessment of property in Lincoln County, \$630, to \$1,170.

We recommend that patented mining claims assessed to the following named mining companies be stricken from the tax-rolls of the counties wherein same are located, affidavits of annual labor on same having been filed:

J. E. Sexton, Eureka County, Windfall group of claims.

E. Wilson and Ole Johnson, White Pine County, one claim.

Nevada Consolidated Mining Company, Nye County, all patented claims.

Gray Mining Company, Elko County, 25 patented claims.

Nevada Horn Silver Mining Company, Lincoln County, six patented claims.

Geo. A. Boyce and C. C. Bach, 10 patented claims.

Kansas City-Nevada Consolidated Mining, all patented claims.

Argentum Mining Company, Mineral County, 23 patented mining claims.

Mt. Diablo Mining and Milling Company, Mineral County, 14 patented claims.

Manhattan Dexter Mines Company, Nye County, one patented mining claim.

Rochester Silver Corporation, Pershing County, three patented mining claims.

Rawhide Mascot Con. Mines Company, Mineral County, two patented mining claims.

Fred Grutt, Grutt and Dunning, Grutt, Dunning and McLeod, four patented mining claims.

Nevada Victory Mining Company, Mineral County, 10 patented mining claims.

Rawhide Consolidated Mines Company, Mineral County, nine patented mining claims.

Consolidated Mayflower Mines, Nye County, 11 patented mining claims.

Southeastern Mining Company, Lincoln County, four patented mining claims.

The Committee on Public Utilities presented the following report, which, after being read by the Secretary, was adopted by the Board.

Wonder Water Company, Churchill County, assessed in Tax Commission Bulletin No. 24, \$10,000; not on tax-roll. Assessor states the same is out of operation.

Nevada Valleys Power Company, Lander County, assessed in Bulletin No. 24, \$15,850; assessed on tax-roll at \$20,000; increased by Assessor, \$4,150.

Ploche Pacific Railroad, Lincoln County, assessed in Bulletin No. 24, \$25,000; assessed on tax-roll at \$22,500; decrease on tax-roll, \$2,500

Yerington Electric Company, Lyon County, assessed in Bulletin No. 24, \$5,000; assessed on roll at \$6,500; increase by Assessor, \$1,500.

Nevada Copper Belt Railroad, Lyon County, assessed in Bulletin No. 24, \$250,000; assessed on roll at \$275,000; increased by Assessor, \$25,000.

We recommend that the above changes be ordered and that all other properties remain on the roll as assessed subject to further equalization by the Nevada Tax Commission.

Mr. J. H. Clemons appeared before the Board in behalf of the Antelope Valley Land and Cattle Company and renewed his request for a reduction in the assessed valuation of certain lands assessed to said company in Lyon County, and presented a statement covering said valuations. The matter was referred to the Land Committee.

Hon. Geo. A. Cole, State Controller, appeared before the Board and requested that there be uniformity of action in placing real estate and personal property on the county tax-rolls. He stated some counties included railroads in real estate and some placed the same on the personal property list.

The Committee on Town Property submitted the following report, which, after being read, on motion duly made, seconded and carried, was adopted by the Board:

We recommend that the petition of the State Bank and Trust Company for a reduction in valuation on its building in Tonopah be denied.

We respectfully refer your Honorable Board to the town property schedules shown in the comparative statement, recommending that you take up each county separately and dispose of them before the Board as a whole.

On motion duly made, seconded and carried, the assessed valuation of all town property as it appears on the tax-roll of Clark County be increased 11.1% and all town and city property in Washoe County, as the same appears on the tax-roll, be increased 10%.

On motion duly made, seconded and carried, it was ordered that a disinterested party to be named by the Chairman of the Board be sent on the lands of Adams and McGill and R. T. Swallow of White Pine, to appraise and value the same, and that said appraiser render his report to the Nevada Tax Commission at its meeting in October.

By recommendation of the Land Committee and on motion duly made, seconded and carried, the petition of the Antelope Valley Land and Cattle Company for a reduction in the assessed valuation of its lands in Lyon County was denied.

The report of the Committee on Banks was again taken up and read by the Secretary, and on motion duly made, seconded and carried, was adopted by said Board.

On motion duly made, seconded and carried, the assessment of the lands of the Antelope Valley Land and Cattle Company was increased by \$1 per acre, in order to allow the representatives of said company to appear before the Tax Commission at its meeting in October.

The Special Committee appointed to recommend an appraiser for the Dunphy lands in Eureka and Lander Counties recommended the

appointment of H. S. Pohe, and on motion duly made, seconded and carried, Mr. Pohe's appointment was recommended by the Board.

The Special Committee appointed to recommend a uniform tax-roll for all counties in the State made a report requesting that the State Auditor take the matter up with the Tax Commission and the County Assessors.

On motion duly made, seconded and carried, railroad lands in Churchill County assessed to the Central Pacific Railway were allowed to stand as placed on said roll by the Assessor of the said county, it having been heretofore shown that the assessment and valuation of said railroad lands were in litigation.

The Land Committee presented the following classification of lands for assessment purposes for the year 1921, which, on motion duly made, seconded and carried, was adopted by the Board:

Land Classification, 1921

Special—

Special land is that land which, by reason of character alone, might be placed in one of the following six classes, but which, by reason of an extra desirable location or other cause, is, in the opinion of the Assessor, of greater valuation than land in general coming under a like character classification; it may be entered on the 1921 assessment roll in a special classification as "Special."

Cultivated—

Cultivated land shall include all vegetable, orchard, grain, timothy, red top, alfalfa, or any other land of same value as cultivated due to special conditions.

First-class cultivated is land capable of producing 4 or more tons of alfalfa, or 1 ton of grain, per acre.

Second-class cultivated is land capable of producing 2 and less than 4 tons alfalfa, or from 1,400 pounds to 1 ton grain, or 1½ tons or more of timothy hay per acre.

Third-class cultivated is all other cultivated land.

Wild Hay or Meadow—

First-class meadow is land capable of producing 1 or more tons to the acre.

Second-class meadow is land capable of producing less than 1 ton per acre

Pasture—

First-class, irrigated.

Second-class, partially irrigated.

Third-class, subirrigated or of special pasture value.

Arable—

First-class arable shall be construed to mean land under fence and with water right.

Second-class.

Third-class.

Grazing—

First-class.

Second-class.

Third-class.

Barren—

One class only.

NOTE—It is recommended that the valuations placed on lands for 1920 be adhered to as near as practicable for 1921. This recommendation does not apply to any county that received special consideration on account of temporary conditions.

The Committee on Business presented the following schedule for the assessment of merchandise in 1921, which, on motion duly made, seconded and carried, was adopted by the Board:

The last previous inventory shall be taken as the basis of valuation, provided the inventory was taken within six (6) months prior to the time of assessment, and a deduction of fifteen per cent (15%) from the inventory value shall be allowed for depreciation.

Under this rule a stock of merchandise showing an inventory value of \$10,000 would have a depreciated value of \$8,500 for assessment.

In the application of this rule. It is the duty of Assessors to demand proper inventories of merchandise stocks from the owners, and in case of refusal, failure or neglect on the part of said owners to furnish the same, Assessors will make an arbitrary assessment as provided by law.

The Committee on Business presented the following schedule for the assessment of motor-driven vehicles for the year 1921, which, on motion duly made, seconded and carried, was adopted:

The assessed valuation of motor-driven vehicles is determined by applying the following percentage factors to the price of machine as printed in the pamphlet:

1921 and Advance Model.....	100% of cost price
1920 Model	90% of list price
1919 Model	80% of list price
1918 Model	65% of list price
1917 Model	50% of list price

There being no further business to come before the meeting at this time, the State Board of Equalization adjourned *sine die*.

FRIDAY, OCTOBER 1, 1920

Meeting called to order by Commissioner J. F. Shaughnessy.

Present—Commissioners J. F. Shaughnessy, W. N. McGill, S. J. Rogers, P. Y. Gillson, M. Reinhart, and Secretary F. N. Fletcher.

Absent—Chairman E. D. Boyle.

Mr. P. H. Cook, General Manager of the Nevada Copper Belt Railroad in Lyon County, appeared before the Commission and presented a statement detailing the condition of said company's property and asked for a substantial reduction from the present assessed valuation of \$300,000. Case submitted.

Mr. Jas. T. Boyd, attorney for the Scheeline Banking and Trust Company, appeared before the Commission, and stated that an error had been made in the report made by said bank to the State Board of Equalization in that the market value of the bank stock should have been placed at \$60 instead of \$75 per share. He requested that the error be corrected and that the valuation of said bank be made to conform to the stock valuation of \$60 per share. Case submitted.

Mr. W. H. Doyle, Vice-president and representative of the following banks, appeared before the Commission: Reno National Bank, Bank of Nevada Savings and Trust Company, First National Bank of Winnemucca, Johns S. Cook & Company, Tonopah Banking Corporation, and Carson Valley Bank. Mr. Doyle made a statement to show the valuations of said banks and the market and sale value of the bank stock. He also stated that the assessed valuations had been placed too high by the State Board of Equalization and requested that reductions be made in the assessed valuations of the same. Cases submitted.

Mr. W. C. Pitt appeared before the Commission in behalf of the Lovelock Mercantile Banking Company, and requested a reduction in the assessed valuation from \$55,000 to \$50,000. Case submitted.

Mr. W. C. Pitt also appeared in behalf of the Pitt Mill and Elevator Company, and requested a reduction in the assessed valuation of that company's property in Pershing County from \$20,000 to \$16,000. Case submitted.

letter from the Assessor of said county recommending the reduction was read. Case submitted.

Mr. J. C. Linabary, representative of the Reno Traction Company, appeared before the Commission and made a statement showing that half of the trackage of said company in Washoe County had been abandoned and taken up during the past year. Mr. Linabary petitioned for a reduction in the assessed valuation of said company. Case submitted.

The case of the Nevada Copper Belt Railway was brought up for consideration of the Commission, and on motion duly made, seconded and carried, the assessed valuation of the property of said company in Lyon County was reduced from \$300,000 to \$210,000.

On motion duly made, seconded and carried, the assessed valuation of the Scheeline Banking and Trust Company was reduced from \$150,000 to \$126,000.

On motion duly made, seconded and carried, the assessed valuation of the Carson Valley Bank was reduced from \$85,000 to \$70,000.

On motion duly made, seconded and carried, the assessed valuation of the Bank of Nevada Savings and Trust Company was reduced from \$120,000 to \$100,000.

On motion duly made, seconded and carried, the assessed valuation of the First National Bank of Winnemucca was reduced from \$350,000 to \$302,000.

On motion duly made, seconded and carried, the assessed valuation of the Winnemucca State Bank and Trust Company was reduced from \$110,000 to \$100,000.

On motion duly made, seconded and carried, the assessed valuation of the Lovelock Mercantile Banking Company was reduced to \$50,000.

On motion duly made, seconded and carried, the assessed valuation of the Pitt Mill and Elevator Company was reduced to \$16,000.

On motion duly made, seconded and carried, the Commission recessed until Saturday, October 2, 1920, at 10 a. m.

SATURDAY, OCTOBER 2, 1920

Meeting called to order by Chairman Boyle.

All members of the Commission present with the exception of Commissioner F. W. Lockman.

Mr. H. G. Marsh, Cashier of the Farmers Bank of Carson Valley, appeared before the Commission and asked for a reduction in the assessed valuation of said bank from \$80,000 to \$53,300.

After consideration, and on motion duly made, seconded and carried, said request was granted.

Mr. E. B. Yerington, Secretary of the Carson Water Company, appeared before the Commission and presented a statement of the company's business. Mr. Yerington requested a reduction in the assessed valuation of said company from \$88,888 to \$80,000.

After consideration, and on motion duly made, seconded and carried, said request was granted.

Mr. A. S. Cooper, Assistant Treasurer of the Nevada-California Power Company, appeared before the Commission and presented a statement showing the condition of the company's business from March 1, 1919, to March 1, 1920, and asked for a reduction in the assessed valuation of its property in Nevada to \$1,118,000.

Mr. W. H. Goodin, Cashier of the First National Bank of Lovelock, appeared before the Commission and requested a reduction in the assessed valuation of said bank from \$84,000 to \$75,600.

On motion duly made, seconded and carried, said request was granted.

On motion duly made, seconded and carried, the assessed valuation of the Churchill County Bank was reduced from \$88,306 to \$66,220.

On motion duly made, seconded and carried, the Commission recessed to meet in the room of the Chamber of Commerce at Reno, Monday, October 4, 1920, at 11 a. m.

MONDAY, OCTOBER 4, 1920

Meeting called to order by Chairman Boyle.

All members of the Commission present.

Chairman Boyle stated that the object of the meeting was to meet with the Taxpayers' Association of Reno, the Truckee River Waterusers' Association, the members of the Board of County Commissioners of said county, and all other interested taxpayers to consider the action of the State Board of Equalization increasing the assessment of town property in Washoe County by 10%, and the valuation of cultivated lands in said county by \$198,487, and briefly explained the reasons for the Board's action. Mr. W. J. Harris, President of the Reno Taxpayers' Association, Hon. P. A. McCarran, in behalf of the Truckee River Waterusers' Association, and Mr. W. H. Simmons in behalf of the city property owners, addressed the Commission, claiming that the increases ordered would prove unjust and inequitable in a large majority of cases, but admitting that in many instances town property was assessed too low. After a lengthy discussion a tentative arrangement was entered into under which the Taxpayers' Associations and the Board of County Commissioners agreed to cooperate with the Tax Commission for a full and just appraisal of the properties in question, provided the Tax Commission rescinded the orders of the State Board of Equalization.

Mr. S. W. Belford, attorney, appeared before the Commission in behalf of the Ely Water Company, and submitted a statement covering the condition of the business of said company and asked for a reduction in the assessed valuation of the same from \$100,000 to \$90,000.

Mr. Belford also requested a reduction in the assessment of the lands belonging to the Ely Water Company in White Pine County. Cases submitted.

Mr. F. G. Waterhouse, General Manager of the Nevada Telegraph and Telephone Company, appeared before the Commission and requested a reduction in the assessed valuation of said company's property in Esmeralda and Nye Counties. Case submitted.

On motion duly made, seconded and carried, the Commission recessed until Tuesday, October 5, 1920, at 10 a. m.

TUESDAY, OCTOBER 5, 1920

Meeting called to order by Chairman Boyle.

All members of the Commission present.

Hon. H. H. Brown, attorney for the Tonopah and Goldfield Railroad, appeared before the Commission and made a statement covering the earnings of the company and asked for a reduction in the assessed

valuation from \$1,912,372 to \$1,700,000, the latter figure being the valuation placed on said company's property in Nevada by the Valuation Bureau of the Interstate Commerce Commission. Case submitted.

Mr. H. C. Shaw, Superintendent, appeared in behalf of the Postal Telegraph-Cable Company, and filed a statement covering the physical valuation of the company's property in the State of Nevada, claiming same to be \$154,851, and requested a reduction in the assessed valuation of the same.

The request of Chas. H. Burritt, attorney for the owners of the English Mill Ditch in Washoe County, that the assessment of the same be stricken from the tax-roll of said county, was denied.

On motion duly made, seconded and carried, the Commission recessed to meet in Carson City, Wednesday, October 6, 1920, at 11 a. m.

WEDNESDAY, OCTOBER 6, 1920

Meeting called to order by Chairman Boyle.

All members of the Commission present.

Mr. Roy Stoddard, attorney, appeared before the Commission in behalf of the Churchill County farmers and taxpayers, and protested against the increase of \$97,000 on the lands in Churchill County ordered by the State Board of Equalization, and requested that whatever action be taken by the Commission with reference to Washoe County be applied to Churchill County also. Case submitted.

The balance of the session was devoted to discussion of tax matters throughout the State.

The Commission recessed until Thursday, October 7, 1920, at 10 a. m.

THURSDAY, OCTOBER 7, 1920

Meeting called to order by Chairman Boyle.

All members of the Commission present.

Mr. J. H. Clemons appeared before the Commission in behalf of the Antelope Valley Land and Cattle Company, and requested a reclassification of 14,569 acres of second-class pasture land in Lyon County, assessed at \$26 per acre, to third-class pasture at \$15 per acre. Case submitted.

Mr. Frank L. Wildes, receiver, and Mr. Geo. S. Green, attorney, for the State Bank and Trust Company, appeared before the Commission and requested a reduction in the assessment of said company's real estate in Nye County from \$71,400 to \$62,000. Mr. Wildes submitted a statement showing the condition of the property.

After consideration, and on motion duly made, seconded and carried, the assessed valuation of said company's property in Nye County was reduced to \$65,000.

Mr. H. C. McTerney, Assistant Tax Attorney for the Central Pacific Railway, appeared before the Commission and requested a reduction in the assessed valuation of said company's railroad lands in Churchill County from \$2.34 per acre to \$1.25 per acre.

On motion duly made, seconded and carried, said request was denied for the reason the question of the valuation of said lands is in litigation.

A letter was received from Attorney-General Fowler in which he stated that no appeal had been taken from the decision of the United States Circuit Court of Appeals in the case of the Nevada-California

Power Company, decided adversely to the State, and giving his reasons therefor.

After discussion, and on motion duly made, seconded and carried, the question of further litigation between the State and the Nevada-California Power Company was submitted to Attorney-General Fowler and Commissioner Shaughnessy.

On motion duly made, seconded and carried, the valuations of railroads and public utilities, as set forth in Tax Commission Bulletin No. 24 for the year 1920, and modified by subsequent action of the Commission, was adopted as the final valuations thereof.

On motion duly made, seconded and carried, the assessed valuation of 14,569 acres of pasture land in Lyon County, belonging to the Antelope Valley Land and Cattle Company, was reduced from \$26 per acre to \$11 per acre.

On motion duly made, seconded and carried, the assessed valuation of the property of the Tonopah and Goldfield Railroad was reduced to \$1,700,000.

On motion duly made, seconded and carried, the assessed valuation of the Reno Traction Company was reduced to \$55,000.

On motion duly made, seconded and carried, the request of the Postal Telegraph-Cable Company for a reduction in the assessed valuation of that company's property was denied.

On motion duly made, seconded and carried, the assessed valuation of the Nevada Telegraph and Telephone Company's property in Esmeralda and Nye Counties was reduced from \$105,300 to \$85,617, and said reduced valuation to be apportioned on a fifty-fifty basis between the two counties.

On motion duly made, seconded and carried, the Commission recessed until Monday, October 25, 1920, at 10 a. m.

MONDAY, OCTOBER 25, 1920

Meeting called to order by Chairman Boyle.

All members of the Commission present.

Mr. W. H. Bridges, Cashier, and Geo. S. Green, attorney, for the Bank of Sparks, appeared before the Commission and requested a reduction in the assessed valuation of said bank from \$35,000 to \$31,250.

After consideration, and on motion duly made, seconded and carried, said request was granted.

Mr. Hugh L. Thomas, Superintendent of the Utah, Nevada and Idaho Telephone Company, appeared before the Commission and requested that the assessed valuation of said company's property in Lander and Nye Counties, Nevada, be stricken from the tax-rolls, as the same property was assessed and belonged to the Austin Manhattan Telephone Company.

On motion duly made, seconded and carried, said request was granted.

Mr. Hugh L. Thomas also requested that the mileage of the Utah, Nevada and Idaho Telephone Company's line in Humboldt County be reduced from 271 miles, with a valuation of \$16,544, to 207 miles with a valuation of \$13,041; and that the mileage of said company in Pershing County be reduced from 358 miles with a valuation of \$20,714, to 272 miles with a valuation of \$17,136.

On motion duly made, seconded and carried, said requests were granted.

The reports of Mr. C. W. Jensen, Appraiser appointed by the Tax Commission to appraise and classify the lands of the Adams-McGill Company, R. T. Swallow and Ely Water Company were received and read by the Secretary. Mr. Jensen's classification and appraisal of the Adams-McGill Company's lands and the R. T. Swallow lands in said White Pine County were adopted by the Commission. Said appraisal and classification resulted in a decrease in the assessed valuation of the Adam-McGill Company lands of \$44,202, and of R. T. Swallow \$4,464. Mr. Jensen's classification and appraisal of the lands of the Ely Water Company were received for filing purposes by the Commission.

On motion duly made, seconded and carried, the decreases in the assessed valuations of the lands of the Adams-McGill Company and R. T. Swallow were ordered made on the tax-rolls of said county.

On motion duly made, seconded and carried, the public utility plant of the Ely Water Company was reduced from \$100,000 to \$90,000.

On motion duly made, seconded and carried, the assessed valuation of the lands belonging to the Ely Water Company in White Pine County was reduced from \$37,711 to \$36,000.

Mr. Wm. M. Kearney appeared in behalf of the Garaventa Land and Cattle Company and requested a reduction in the assessed valuation of said company's property in Lyon County from \$41,538 to \$30,000. Mr. Kearney made a statement concerning the company's affairs and the valuation of the property.

After consideration, and on motion duly made, seconded and carried, said request was granted.

The report of Mr. H. S. Pohe, Field Agent of the Tax Commission, on the classification and valuation of the lands belonging to the heirs of the Dunphy Estate in Eureka and Lander Counties, was received and read by the Secretary.

On motion duly made, seconded and carried, the assessed valuation of the Dunphy lands in said counties was left unchanged and the request of the owners for a reduction was denied.

On motion duly made, seconded and carried, the report of Mr. Pohe on said Dunphy lands was accepted and adopted by the Tax Commission as the classification and valuation of said lands in said counties.

On motion duly made, seconded and carried, Commissioner Gillson was appointed to act as the agent of the Tax Commission in the matter of appraising the property valuations in Washoe County.

On motion duly made, seconded and carried, the following resolution was adopted:

WHEREAS, A specific offer has been made by the Board of County Commissioners of Washoe County, the Reno Taxpayers' Association, and the Truckee River Waterusers' Association, to join the Nevada Tax Commission in a joint survey, appraisal, classification, assessment and valuation of all property in Washoe County, provided the action of the State Board of Equalization in placing a 10% increase on all town property and an increase of \$198,487 on all cultivated lands in said county be rescinded by the Tax Commission; and

WHEREAS, All assurances have been given to the Tax Commission by the duly authorized representatives of the Board of County Commissioners, Reno Taxpayers' Association and the Truckee River Waterusers' Association that said scientific survey, appraisal, classification, assessment and valuations of all property in said county will be undertaken on the foregoing basis; and

WHEREAS, The said Board of County Commissioners, Reno Taxpayers' Association and Truckee River Waterusers' Association, through their representatives, have agreed to enter into stipulations in writing on this proposition; now, therefore, be it

Resolved, That upon receipt of said stipulations, properly signed and executed, that the Tax Commission enter an order rescinding all action taken by the State Board of Equalization in placing said increases on the property of said county as herein set forth; be it further

Resolved, That if the counties of Clark and Churchill, through its representatives, enter into like stipulations, that orders be entered by the Tax Commission rescinding all action taken by said State Board in placing increases on lands and town property in said counties.

There being no further business to come before the Commission, on motion duly made, seconded and carried, a recess was taken subject to the call of the Chair.

TABLE No. 1
Statement of the Assessed Valuations of Property by Classes and Counties for Years 1919-1920, Compiled from Segregations of Tax Rolls by County Assessors

County	Total valuation of county	Privately Owned Land			Railroad Land			Live Stock			Railroads			Public Utilities		
		Valuation	Per cent of taxes paid by	Valuation	Per cent of taxes paid by	Valuation	Per cent of taxes paid by	Valuation	Per cent of taxes paid by	Valuation	Per cent of taxes paid by	Valuation	Per cent of taxes paid by	Valuation	Per cent of taxes paid by	Valuation
Churchill	\$9,376,944	\$1,982,165	21.14	\$957,890	10.21	\$733,787	7.83	\$3,399,833	36.26	\$278,542	2.97	\$3,399,833	36.26	\$278,542	2.97	\$3,399,833
Clark	9,728,499	2,077,138	21.35	1,021,963	10.50	786,914	8.09	3,777,592	38.83	308,015	3.16	3,777,592	38.83	308,015	3.16	3,777,592
Doyle	8,231,140	842,561	10.24	1,021,963	10.50	786,914	8.09	3,777,592	38.83	308,015	3.16	3,777,592	38.83	308,015	3.16	3,777,592
Douglas	8,704,556	1,070,820	12.30	248,407	2.85	248,407	2.85	5,460,438	62.73	534,273	6.14	5,460,438	62.73	534,273	6.14	5,460,438
Elko	3,568,382	1,743,691	48.87	844,322	23.66	844,322	23.66	76,617	2.15	55,068	1.54	76,617	2.15	55,068	1.54	76,617
Elko	4,072,761	1,980,979	48.89	844,322	21.80	844,322	21.80	85,130	2.09	59,676	1.47	85,130	2.09	59,676	1.47	85,130
Elko	41,365,812	9,316,342	22.52	7,181,790	17.36	7,181,790	17.36	16,863,609	40.77	780,601	1.89	16,863,609	40.77	780,601	1.89	16,863,609
Emeralda	44,762,219	11,183,728	24.98	2,985,577	6.68	6,310,690	14.10	18,731,198	41.84	844,931	1.89	18,731,198	41.84	844,931	1.89	18,731,198
Emeralda	5,912,588	77,262	1.31	2,985,577	6.68	6,310,690	14.10	18,731,198	41.84	844,931	1.89	18,731,198	41.84	844,931	1.89	18,731,198
Eureka	6,371,026	86,297	1.34	508,945	7.99	848,587	13.32	3,877,752	63.02	139,686	2.19	3,877,752	63.02	139,686	2.19	3,877,752
Eureka	7,003,635	987,747	15.60	512,936	7.32	774,817	11.06	3,752,607	53.58	163,470	2.33	3,752,607	53.58	163,470	2.33	3,752,607
Humboldt	17,654,579	1,149,492	6.41	1,124,186	6.37	3,277,773	18.57	7,307,307	42.50	512,509	2.90	7,307,307	42.50	512,509	2.90	7,307,307
Humboldt	19,106,967	3,697,026	19.35	1,216,817	6.37	3,054,231	15.99	8,119,228	42.50	589,929	3.06	8,119,228	42.50	589,929	3.06	8,119,228
Lander	6,471,969	1,018,763	15.74	708,560	10.95	1,228,312	18.98	2,510,545	38.79	151,133	2.34	2,510,545	38.79	151,133	2.34	2,510,545
Lander	6,927,984	1,111,738	16.05	791,333	11.42	1,220,901	17.62	2,789,494	40.27	168,828	2.44	2,789,494	40.27	168,828	2.44	2,789,494
Lincoln	7,382,772	216,054	2.93	1,110,799	15.05	1,107,199	15.05	5,176,396	70.11	128,594	1.74	5,176,396	70.11	128,594	1.74	5,176,396
Lyon	8,181,778	325,242	3.98	1,057,199	12.92	1,057,199	12.92	6,753,912	82.53	163,779	2.00	6,753,912	82.53	163,779	2.00	6,753,912
Lyon	10,318,167	3,059,732	29.67	321,074	3.11	1,197,091	11.60	8,086,266	79.91	255,769	2.48	8,086,266	79.91	255,769	2.48	8,086,266
Mineral	11,312,190	8,355,905	73.85	321,074	2.84	1,213,516	10.73	3,366,194	29.76	328,625	2.93	3,366,194	29.76	328,625	2.93	3,366,194
Mineral	4,820,442	251,641	5.45	321,074	6.68	338,253	8.40	2,983,966	64.80	301,647	6.53	2,983,966	64.80	301,647	6.53	2,983,966
Nye	10,653,857	806,565	7.56	1,181,512	11.11	338,189	6.69	3,312,962	31.11	378,348	3.53	3,312,962	31.11	378,348	3.53	3,312,962
Nye	11,925,774	821,144	6.85	1,181,512	11.11	338,189	6.69	3,312,962	31.11	378,348	3.53	3,312,962	31.11	378,348	3.53	3,312,962
Ormsby	1,742,836	950,201	54.55	4,690	.27	1,650,590	14.89	446,452	4.17	1,769,172	16.61	446,452	4.17	1,769,172	16.61	446,452
Ormsby	1,808,613	237,771	13.15	4,690	.27	1,650,590	14.89	446,452	4.17	1,769,172	16.61	446,452	4.17	1,769,172	16.61	446,452
Pershing	12,907,249	1,996,295	15.46	1,823,404	14.18	656,970	5.25	6,274,230	50.17	382,806	2.97	6,274,230	50.17	382,806	2.97	6,274,230
Pershing	13,925,229	1,852,695	13.30	1,581,680	11.36	922,790	6.63	6,969,922	49.98	413,359	2.90	6,969,922	49.98	413,359	2.90	6,969,922
Storey	2,005,908	41,885	2.09	145,512	7.24	8,423	.45	823,255	39.59	259,091	13.79	823,255	39.59	259,091	13.79	823,255
Storey	2,005,908	57,302	2.86	221,725	11.05	10,498	.52	823,255	41.04	273,083	13.61	823,255	41.04	273,083	13.61	823,255
Washoe	32,909,854	3,823,655	11.62	3,824,770	11.62	2,367,760	7.19	8,014,347	24.35	2,679,180	8.14	8,014,347	24.35	2,679,180	8.14	8,014,347
Washoe	34,545,906	4,086,267	11.83	3,824,770	11.11	2,367,760	6.28	8,904,620	25.78	2,995,969	8.67	8,904,620	25.78	2,995,969	8.67	8,904,620
White Pine	17,298,735	1,065,050	6.16	356,090	2.03	1,818,027	10.51	2,826,268	16.34	223,146	1.28	2,826,268	16.34	223,146	1.28	2,826,268
White Pine	17,472,228	1,409,101	8.06	356,090	2.03	1,818,027	10.51	2,826,268	16.34	223,146	1.28	2,826,268	16.34	223,146	1.28	2,826,268
Totals for State	\$198,392,415	\$30,490,762	15.47	\$8,544,558	4.31	\$23,580,241	11.80	\$70,183,188	35.41	\$10,450,812	5.27	\$70,183,188	35.41	\$10,450,812	5.27	\$70,183,188
Totals for State	212,077,329	34,962,436	16.40	9,013,901	4.26	22,404,104	10.50	77,206,053	36.45	11,940,077	5.63	77,206,053	36.45	11,940,077	5.63	77,206,053

TABLE NO. 1--Continued

County	Total valuation of county	Net Proceeds of Mines		Town Property		Country Property Improvements		Water Rights and Pipe Lines		Other Personal Property	
		Valuation	Per cent of taxes paid by	Valuation	Per cent of taxes paid by	Valuation	Per cent of taxes paid by	Valuation	Per cent of taxes paid by	Valuation	Per cent of taxes paid by
Churchill.....	\$9,376,944	\$259,515	2.77	\$24,012	6.65	\$349,720	3.73	-----	-----	\$158,442	1.69
-----1919	9,728,499	-----	-----	715,313	7.35	846,855	3.57	-----	-----	149,478	1.64
Clark.....	8,231,140	59,875	.73	914,497	11.11	88,168	1.07	-----	-----	211,023	2.56
-----1919	8,704,556	258,235	2.97	548,176	6.30	40,689	1.47	-----	-----	68,074	.78
Douglas.....	3,688,382	-----	-----	287,965	7.51	158,092	4.43	-----	-----	124,798	3.50
-----1919	4,072,761	-----	-----	380,360	8.11	165,975	4.08	-----	-----	133,230	3.27
Elko.....	41,365,812	120,187	.29	1,896,796	4.59	634,982	1.53	-----	-----	314,986	.76
-----1919	44,762,219	55,827	.12	2,071,641	4.63	812,770	1.81	-----	-----	319,187	.71
Esmeralda.....	5,912,588	250,000	4.23	254,015	4.30	23,365	.39	-----	.05	42,950	.73
-----1919	5,614,399	58,982	1.05	193,178	3.44	21,929	.39	-----	-----	67,528	1.03
Eureka.....	6,371,026	17,197	.27	91,126	1.43	53,466	.92	-----	-----	90,859	1.43
-----1919	7,003,635	-----	-----	162,374	2.32	60,780	.88	-----	-----	41,653	.60
Humboldt.....	17,664,579	79	.00	1,013,723	5.74	224,192	1.27	-----	-----	139,658	.79
-----1919	19,105,067	429	.00	1,088,433	5.70	296,036	1.50	-----	-----	185,583	.97
Lander.....	6,471,984	-----	-----	207,155	3.20	79,700	1.23	-----	-----	129,667	2.00
-----1919	7,382,772	62,000	.84	212,896	3.08	62,195	.90	-----	-----	97,687	1.41
Lincoln.....	8,181,778	90,754	1.10	238,187	3.23	35,225	.48	-----	-----	75,072	1.02
-----1919	10,318,167	74,580	.72	132,145	1.62	50,203	.60	-----	-----	110,145	1.35
Lyon.....	11,312,130	100,800	.88	486,930	4.72	60,390	.49	-----	-----	303,230	2.94
-----1919	4,620,642	28,297	.61	569,296	4.94	10,450	.09	-----	-----	265,050	2.84
Mineral.....	4,981,483	-----	-----	119,298	2.58	311,383	2.75	-----	-----	36,451	.79
-----1919	10,653,587	1,644,910	14.50	1,215,333	11.41	35,600	.77	-----	-----	29,570	.59
Nye.....	11,925,774	1,709,834	14.34	655,467	10.43	107,304	1.01	-----	-----	228,170	2.14
-----1919	11,742,936	-----	-----	682,455	10.43	36,389	1.24	-----	-----	254,458	2.13
Ormsby.....	1,808,613	-----	-----	686,951	34.97	38,967	2.09	-----	-----	99,669	5.68
-----1919	12,507,144	339,233	2.44	714,201	5.09	105,019	2.12	-----	-----	93,692	6.18
Pershing.....	13,925,229	82,000	1.70	238,010	12.67	99,390	.84	-----	-----	111,208	.89
-----1919	1,879,088	-----	-----	222,142	11.09	13,483	.71	-----	-----	187,150	.98
Storey.....	32,909,354	-----	-----	11,138,320	33.85	529,611	1.61	-----	-----	31,014	1.65
-----1919	34,545,606	-----	-----	10,868,968	31.46	513,055	1.61	-----	-----	31,620	1.58
Washoe.....	17,298,735	2,032,001	11.75	10,868,968	4.64	401,918	1.48	-----	-----	748,964	2.28
-----1919	17,472,228	865,901	4.96	719,139	4.12	1,133,375	2.32	-----	-----	761,900	2.21
White Pine.....	-----	-----	-----	-----	-----	-----	-----	-----	-----	905,962	5.24
-----1920	-----	-----	-----	-----	-----	-----	-----	-----	-----	1,233,055	7.05
Totals for State.....	\$198,282,815	\$4,480,441	2.26	\$20,800,864	10.49	\$2,981,803	1.48	\$483,096	.24	\$3,751,583	1.89
-----1919	212,077,329	3,479,205	1.64	20,532,964	9.68	4,139,528	1.96	357,566	.17	3,969,080	1.87

REPORT OF NEVADA TAX COMMISSION

County	Total valuation of county	Merchandise		Banks		Motor Vehicles		Mine Improvements and Patented Claims	
		Valuation	Per cent of taxes paid by	Valuation	Per cent of taxes paid by	Valuation	Per cent of taxes paid by	Valuation	Per cent of taxes paid by
Churchill	1919	\$9,376,944	1.55	\$116,961	1.25	\$148,566	1.58	\$222,102	2.37
	1920	9,728,499	1.66	81,346	.54	228,683	2.36	73,089	2.75
Clark	1919	8,231,140	1.13	60,000	.73	109,323	1.23	109,323	9.52
	1920	8,704,566	1.17	62,000	.80	181,747	1.83	262,797	3.02
Douglas	1919	3,568,382	2.69	70,800	1.86	127,084	3.57	3,000	.10
	1920	4,072,761	3.67	78,800	1.82	188,966	4.38	408,297	.97
Elko	1919	41,366,812	.66	343,800	.83	482,710	1.06	493,263	.84
	1920	44,762,219	.69	308,800	.68	484,967	1.02	493,263	.84
Esmeralda	1919	5,612,568	.88	46,000	.76	153,171	1.41	1,890,989	91.82
	1920	5,614,399	.86	46,000	.89	153,171	1.40	1,890,989	91.82
Eureka	1919	6,371,028	.66	50,000	.69	106,461	1.40	153,171	17.43
	1920	7,008,638	.86	50,000	.69	106,461	.46	153,171	3.88
Humboldt	1919	17,664,579	1.07	427,500	2.42	120,483	.83	76,985	.44
	1920	19,106,067	1.07	427,500	2.24	120,483	.83	76,985	.44
Lander	1919	6,471,969	1.51	42,800	.66	46,223	.71	297,184	3.69
	1920	6,927,354	1.71	41,200	.66	46,223	.68	297,184	3.69
Lincoln	1919	7,382,772	.24	22,800	.30	31,780	.44	376,326	4.49
	1920	8,181,778	.24	19,408	.30	31,780	.44	376,326	4.49
Lyon	1919	10,318,167	2.27	18,408	.36	204,744	2.00	894,895	9.03
	1920	11,312,190	2.27	107,460	.36	204,744	2.46	894,895	7.38
Mineral	1919	4,620,642	1.97	107,460	.96	287,792	1.47	339,747	5.43
	1920	4,961,463	1.97	107,460	.96	287,792	2.30	339,747	5.43
Nye	1919	10,683,587	3.79	125,000	1.17	306,898	2.90	1,922,488	18.03
	1920	11,925,686	4.23	170,000	1.43	306,898	4.13	1,922,488	22.03
Ormsby	1919	297,946	4.53	70,000	8.97	482,168	4.83	2,623,086	16.03
	1920	342,968	4.11	70,000	8.97	482,168	4.83	2,623,086	16.03
Pershing	1919	12,807,444	1.19	131,600	.97	78,667	.68	9,900	.16
	1920	13,925,623	1.01	131,600	.97	78,667	.74	9,900	.16
Murray	1919	2,614,968	1.89	28,140	1.89	169,870	1.50	485,195	3.88
	1920	2,614,968	1.89	28,140	1.89	169,870	1.46	485,195	3.88
Washoe	1919	92,900,314	2.66	1,717,500	5.22	580,787	1.76	310,505	16.53
	1920	92,900,314	2.77	1,841,260	5.32	580,787	1.76	310,505	16.53
White Pine	1919	17,294,735	12.30	182,750	1.77	1,011,374	2.93	58,510	14.91
	1920	17,472,228	12.63	175,000	1.00	1,011,374	2.93	58,510	14.91
Total for State	1919	\$198,282,815	2.46	\$3,893,513	1.71	\$2,633,589	1.38	\$11,472,421	5.79
	1920	212,077,829	2.40	3,563,848	1.63	3,719,712	1.75	11,647,881	5.45

TABLE No. 2
County Valuations and Tax Rates, 1919

Counties	Valuation as estimated in budgets	Original tax rolls	Final tax rolls	Initial tax rate	Final tax rate
Churchill.....	\$9,000,000	\$9,358,972	\$9,376,944	\$1.5108	\$1.5004
Clark.....	7,895,000	8,220,050	8,231,140	1.80	1.66
Douglas.....	3,500,000	3,469,409	3,565,332	1.64	1.84
Elko.....	41,000,000	41,173,047	41,365,812	.856	.856
Esmeralda.....	5,200,000	6,007,494	5,912,588	1.71	1.71
Eureka.....	6,828,071	6,553,517	6,371,028	1.02	1.07
Humboldt.....	17,400,000	17,600,449	17,654,679	.95	.9855
Lander.....	6,165,000	6,506,311	6,471,969	1.38	1.32
Lincoln.....	7,228,324	7,848,203	7,382,772	1.00	1.00
Lyon.....	9,000,000	10,479,968	10,315,167	1.0241	.90
Mineral.....	4,800,000	4,647,069	4,620,642	2.0795	1.35
Nye.....	11,000,000	11,174,369	10,653,587	1.30	1.35
Ormsby.....	1,700,000	1,766,995	1,742,986	2.0295	2.0295
Pershing.....	12,000,000	12,439,130	12,507,144	.95	.95
Storey.....	1,825,000	1,887,135	1,879,088	1.85	1.85
Washoe.....	32,500,000	32,676,012	32,909,354	1.1695	1.1595
White Pine.....	14,750,000	16,951,795	17,296,735	1.40	1.40
Totals.....	\$191,449,455	\$198,259,845	\$196,292,815		

TABLE No. 3
County Valuations and Tax Rates, 1920

Counties	Valuation as estimated in budgets	Original tax rolls	Final tax rolls	Initial tax rate	Final tax rate
Churchill.....	\$9,000,000	\$3,765,073	\$9,728,499	\$1.344	\$1.2396
Clark.....	8,840,000	8,761,931	8,704,556	1.75	1.75
Douglas.....	4,000,000	4,198,467	4,072,761	1.97	1.97
Elko.....	44,700,000	44,767,219	44,762,219	1.037	1.037
Esmeralda.....	5,200,000	5,846,709	5,614,339	1.71	1.71
Eureka.....	7,098,272	7,011,465	7,003,635	1.315	1.315
Humboldt.....	19,008,000	19,163,136	19,105,067	1.3855	1.3855
Lander.....	7,000,000	6,923,291	6,927,384	1.26	1.26
Lincoln.....	8,225,000	8,537,936	8,181,778	1.20	1.23
Lyon.....	11,000,000	11,788,750	11,312,190	1.4574	1.4574
Mineral.....	5,000,000	5,024,848	4,981,483	1.9155	1.9155
Nye.....	12,000,000	11,949,712	11,925,774	1.415	1.415
Ormsby.....	1,700,000	1,817,901	1,808,613	2.6155	2.6155
Perth.....	14,000,000	13,957,657	13,995,229	.90	.90
Storey.....	1,875,000	2,011,898	2,005,908	2.075	2.075
Washoe.....	33,000,000	34,441,552	34,545,696	1.3155	1.3155
White Pine.....	20,000,000	17,440,768	17,472,228	1.46	1.46
Totals.....	\$211,646,272	\$218,372,223	\$212,077,329		

TABLE No. 4
Estimated Expenditures of Counties, Including Cities and Special Districts, for the Year 1919, as Compiled From Budgets
Filed With the Nevada Tax Commission

County	General expenses	Indigent fund	Streets and Highways	Educational	Bond redemption, interest and debts	Total expenditures	Revenue other than taxes	Revenue from taxes	Estimated tax rate
Churchill—General	\$48,700	\$8,100	9,000	\$67,000	\$25,280	\$158,080	\$22,100	\$135,980	\$1.5108
City of Fallon	12,440		3,000		2,440	17,880	2,880	15,000	1.456
Special districts				17,208	9,594	26,802		26,802	
Totals	\$61,140	\$8,100	\$12,000	\$84,208	\$37,314	\$202,762	\$24,980	\$177,782	
Clark—General	\$48,000	\$4,000	\$19,886	\$76,000	\$35,417	\$183,312	\$41,370	\$141,942	\$1.80
City of Las Vegas	7,864		2,384		3,060	13,318	4,000	9,318	.75
Special districts				8,718	7,250	15,968		15,968	
Totals	\$55,864	\$4,000	\$22,289	\$84,718	\$46,727	\$212,598	\$45,370	\$167,228	
Douglas—General	\$19,650	\$2,310	\$15,350	\$28,232	\$5,950	\$72,052	\$14,652	\$57,400	\$1.64
Special districts	1,200			1,900	750	3,850		3,850	
Totals	\$20,850	\$2,310	\$15,350	\$30,132	\$6,700	\$75,902	\$14,652	\$61,250	
Elko—General	\$140,000	\$18,700	\$124,550	\$156,233	\$51,940	\$491,423	\$140,463	\$350,960	\$0.856
City of Elko	26,900				16,700	42,600	10,252	32,348	1.40
Special districts				21,797	19,886	41,683		41,683	
Totals	\$166,900	\$18,700	\$124,550	\$178,030	\$67,626	\$575,706	\$150,715	\$424,991	
Emeralda—General	\$39,000	\$12,000	\$11,200	\$28,000	\$13,000	\$103,200	\$14,039	\$89,161	\$1.71
Special districts	8,420			1,455	5,950	15,825		15,825	
Totals	\$47,420	\$12,000	\$11,200	\$29,455	\$18,950	\$119,025	\$14,039	\$104,986	
Eureka—General	\$35,000	\$4,000	\$17,628	\$23,287		\$79,915	\$12,195	\$67,720	\$1.02
Special districts	716			871		1,587		1,587	
Totals	\$35,716	\$4,000	\$17,628	\$24,158		\$81,502	\$12,195	\$69,307	
Humboldt—General	\$76,161	\$10,816	\$56,967	\$52,977	\$34,272	\$231,193	\$65,393	\$165,800	\$0.95
City of Winnemucca	14,105		21,591		7,500	43,486	11,496	32,000	1.355
Special districts				7,447	1,441	8,888		8,888	
Totals	\$90,266	\$10,816	\$78,558	\$60,424	\$43,213	\$283,577	\$77,389	\$206,188	

TABLE NO. 4—Continued

County	General expenses	Indigent fund	Streets and Highways	Educational	Bond redemption, interest, and debts	Total expenditures	Revenue other than taxes	Revenue other than taxes	Estimated tax rate
Lander—General	\$45,000	\$8,500	\$18,165	\$19,250	-----	\$90,915	\$9,670	\$81,245	\$1.88
Special districts	-----	-----	-----	4,612	\$2,403	6,915	-----	6,915	-----
Totals	\$45,000	\$8,500	\$18,165	\$23,762	\$2,403	\$97,580	\$9,670	\$88,160	-----
Lincoln—General	\$28,000	\$2,500	\$13,000	\$40,500	\$31,635	\$115,635	\$43,372	\$72,263	\$1.00
Special districts	317	-----	-----	712	-----	1,029	-----	1,029	-----
Totals	\$28,317	\$2,500	\$13,000	\$41,212	\$31,635	\$116,664	\$43,372	\$73,292	-----
Lyon—General	\$53,325	\$6,000	\$40,500	\$30,000	\$9,625	\$139,450	\$47,340	\$92,110	\$1.0241
City of Yerington	9,200	-----	3,000	-----	5,325	18,025	11,000	7,025	1.50
Special districts	-----	-----	-----	25,605	6,160	31,765	-----	-----	-----
Totals	\$62,525	\$6,000	\$43,500	\$55,605	\$21,611	\$189,241	\$58,340	\$99,136	-----
Mineral—General	\$43,317	\$11,300	\$19,600	\$22,340	\$11,800	\$108,357	\$12,700	\$95,657	\$2.0795
Special districts	-----	-----	-----	2,000	-----	2,000	-----	2,000	-----
Totals	\$43,317	\$11,300	\$19,600	\$24,340	\$11,800	\$110,357	\$12,700	\$97,657	-----
Nye—General	\$95,000	\$20,600	\$25,000	\$69,500	\$2,950	\$213,050	\$70,060	\$143,000	\$1.30
Special districts	-----	17,600	15,000	16,950	5,390	55,940	-----	55,940	-----
Totals	\$95,000	\$38,200	\$40,000	\$85,450	\$8,340	\$266,990	\$70,060	\$196,940	-----
Ormsby—General	\$19,100	\$2,900	\$5,700	\$25,300	\$4,600	\$57,600	\$23,100	\$34,500	\$2.0295
City of Carson	7,000	-----	6,500	-----	4,000	17,500	6,000	11,500	1.06
Special districts	-----	-----	-----	-----	4,020	4,020	-----	4,020	-----
Totals	\$26,100	\$2,900	\$12,200	\$25,300	\$12,620	\$79,120	\$29,100	\$50,020	-----
Perkins—General	\$46,400	\$6,000	\$30,000	\$41,600	\$23,000	\$147,000	\$33,000	\$114,000	\$0.95
City of Lovelock	18,004	-----	4,200	-----	14,723	31,927	12,201	19,725	2.01
Special districts	-----	-----	-----	5,340	7,500	13,140	-----	13,140	-----
Totals	\$64,404	\$6,000	\$34,200	\$46,940	\$45,523	\$192,067	\$45,201	\$146,865	-----
Storey—General	\$22,900	\$9,000	\$300	\$13,500	-----	\$45,700	\$10,823	\$34,872	\$1.85
Special districts	7,640	-----	8,800	991	-----	11,871	-----	11,871	-----
Totals	\$29,540	\$9,000	\$4,200	\$14,491	-----	\$57,871	\$10,823	\$46,748	-----

Washoe—General.....	\$118,160	\$32,500	\$79,875	\$179,060	\$40,550	\$449,625	\$75,950	\$373,675	\$1,1695
City of Reno.....	102,880	25,900	25,900	179,060	80,000	158,780	34,197	124,583	.95
City of Sparks.....	9,199	---	17,715	---	4,000	30,914	4,026	26,888	1.00
Special districts.....	---	---	---	64,864	44,585	106,959	---	108,959	---
Totals.....	\$230,179	\$32,500	\$122,990	\$243,414	\$119,145	\$748,228	\$114,173	\$634,065	---
White Pine—General.....	\$107,000	\$20,000	\$86,500	\$90,000	\$17,150	\$330,650	\$82,500	\$238,150	\$1.40
City of Ely.....	19,353	---	4,347	---	3,200	26,900	9,400	17,500	1.75
Special districts.....	969	---	---	22,340	38,098	61,407	---	61,407	---
Totals.....	\$127,322	\$20,000	\$90,847	\$112,340	\$58,448	\$408,957	\$91,900	\$317,057	---
Grand totals.....	\$1,225,260	\$197,326	\$680,577	\$1,163,979	\$550,965	\$3,818,097	\$824,674	\$2,961,657	---
Totals for year 1918.....	\$1,321,740	\$201,478	\$696,748	\$1,145,221	\$487,913	\$3,702,102	\$910,852	\$2,899,049	---

TABLE No. 5
Estimated Expenditures of Counties, Including Cities and Special Districts, for the Year 1920, as Compiled From Budgets Filed with Nevada Tax Commission.

County	General expense	Indigent fund	Highways and streets	Educational	Bond redemption, interest, and debits	Estimated total expenditures	Revenue other than taxes	Revenue from taxes	Estimated tax rate
Churchill—General	\$56,950	\$8,100	\$9,000	\$84,060	\$7,200	\$145,310	\$24,350	\$120,960	\$1.344
City of Fallon	17,068		4,500	15,116	3,220	24,788	7,282	17,506	1.74
Special districts					15,582	31,668		31,668	
Totals	\$74,018	\$8,100	\$13,500	\$79,176	\$26,972	\$201,766	\$31,602	\$170,164	
Clark—General	\$53,800	\$3,586	\$24,100	\$67,062	\$38,012	\$196,500	\$31,800	\$154,700	\$1.75
City of Las Vegas	7,861		4,000	34,147	8,060	14,421	4,200	10,221	.7684
Special districts	10,709				8,618	53,371		53,371	
Totals	\$71,870	\$3,586	\$28,100	\$101,199	\$49,587	\$254,292	\$36,000	\$218,292	
Douglas—General	\$21,780	\$2,000	\$19,800	\$34,675	\$17,200	\$95,455	\$16,655	\$78,800	\$1.97
Special districts	1,300			2,880	770	4,950		4,950	
Totals	\$23,080	\$2,000	\$19,800	\$37,555	\$17,970	\$100,405	\$16,655	\$83,750	
Elko—General	\$146,000	\$18,700	\$154,700	\$181,620	\$38,060	\$535,980	\$74,700	\$461,280	\$1.037
City of Elko	21,025		9,800	33,046	16,180	47,005	14,179	32,826	1.26
Special districts					22,818	55,864		55,864	
Totals	\$167,025	\$18,700	\$164,500	\$214,666	\$74,068	\$638,849	\$88,879	\$550,970	
Esmeralda—General	\$43,000	\$12,000	\$10,228	\$32,000	\$10,171	\$107,399	\$18,479	\$88,920	\$1.71
Special districts	8,047			2,540	7,650	18,237		18,237	
Totals	\$51,047	\$12,000	\$10,228	\$34,540	\$17,821	\$125,636	\$18,479	\$107,157	
Eureka—General	\$45,474	\$3,275	\$28,659	\$31,277		\$108,685	\$10,343	\$98,342	\$1.315
Special districts	720				\$871	1,691		1,691	
Totals	\$46,194	\$3,275	\$28,659	\$31,277	\$871	\$105,276	\$10,343	\$94,933	
Humboldt—General	\$63,000	\$10,000	\$54,000	\$55,350	\$48,091	\$227,441	\$49,621	\$177,820	\$0.9855
City of Winnemucca	18,102		20,000		6,000	44,102	10,860	\$3,752	1.465
Special districts				7,573	2,280	9,853		9,853	
Totals	\$81,102	\$10,000	\$74,000	\$62,923	\$53,371	\$281,396	\$60,481	\$221,425	
Lander—General	\$51,600	\$8,400	\$17,600	\$20,100	\$97,700	\$27,700	\$0,500	\$28,200	\$1.26
Special districts			4,500	6,028	92,408	12,028		12,028	
Totals	\$51,600	\$8,400	\$22,100	\$26,128	\$99,408	\$39,728	\$0,500	\$40,228	

Totals	\$34,244	\$4,186	\$12,000	\$58,985	\$50,680	\$160,045	\$52,853	\$107,192	\$1,457.4
Lyon—General	\$61,625	\$11,500	\$77,000	\$37,450	\$6,500	\$194,075	\$33,950	\$160,125	1.60
City of Yerington	\$3,860		3,000	42,538	9,533	66,333	56,458	9,923	
Special districts					6,649	49,288		49,288	
Totals	\$115,475	\$11,500	\$80,000	\$80,089	\$22,682	\$309,696	\$80,408	\$219,288	\$1,915.5
Mineral—General	\$43,905	\$10,250	\$24,500	\$24,500	\$13,970	\$117,125	\$21,350	\$95,775	
Special districts				1,380		1,380		1,380	
Totals	\$43,905	\$10,250	\$24,500	\$25,880	\$13,970	\$118,505	\$21,350	\$97,155	
Nye—General	\$118,780	\$6,000	\$22,000	\$31,250	\$3,180	\$241,210	\$72,010	\$169,200	\$1.41
Special districts	18,000		16,000	19,730	5,900	59,530		59,530	
Totals	\$136,780	\$6,000	\$38,000	\$110,980	\$9,080	\$300,840	\$72,010	\$228,830	
Ormsby—General	\$18,000	\$4,500	\$12,250	\$26,500	\$66,302	\$127,552	\$33,088	\$44,464	\$2,615.5
City of Carson	8,500		5,500		5,000	19,000	7,500	11,200	1.05
Special districts					2,250	2,250		2,250	
Totals	\$26,500	\$4,500	\$17,750	\$26,500	\$73,552	\$148,802	\$30,888	\$57,914	
Pershing—General	\$46,717	\$6,300	\$26,000	\$45,700	\$17,500	\$142,217	\$16,217	\$126,000	\$0.90
City of Lovelock	19,500		4,818		13,040	37,358	17,560	20,008	1.70
Special districts				11,114	16,435	27,599		27,599	
Totals	\$66,217	\$6,300	\$30,818	\$56,814	\$47,025	\$207,174	\$33,567	\$173,607	
Storey—General	\$22,945	\$3,944	\$1,200	\$15,312		\$48,401	\$9,495	\$38,906	\$2.075
Special districts	9,788			1,315		11,103		11,103	
Totals	\$32,733	\$3,944	\$1,200	\$16,627		\$59,504	\$9,495	\$50,009	
Washoe—General	\$165,950	\$33,500	\$37,800	\$183,820	\$51,315	\$522,485	\$98,370	\$434,115	\$1,315.5
City of Reno	171,692		\$33,941		88,367	\$44,000	409,549	140,451	1.00
City of Sparks	13,770		15,110		3,842	\$2,722	10,613	22,109	.90
Special districts				59,288	4,635	103,918		103,918	
Totals	\$351,412	\$33,500	\$436,851	\$243,103	\$138,159	\$1,203,125	\$502,533	\$700,593	
White Pine—General	\$112,756	\$30,000	\$45,000	\$112,748	\$32,000	\$352,504	\$60,504	\$292,000	\$1.46
City of Ely	20,752		10,810		3,200	\$4,762	12,500	22,282	1.75
Special districts				33,537	14,541	47,878		47,878	
Totals	\$133,508	\$30,000	\$75,810	\$146,285	\$49,541	\$435,144	\$73,004	\$362,140	
Grand totals for 1919	\$1,506,710	\$181,291	\$1,072,816	\$1,352,524	\$647,742	\$4,761,083	\$1,217,536	\$3,543,547	
Grand totals for 1920	\$1,225,260	\$197,326	\$680,577	\$1,163,979	\$550,955	\$3,818,097	\$556,440	\$2,961,657	

TABLE No. 5
Estimated Expenditures of Counties, Including Cities and Special Districts, for the Year 1920, as Compiled From Budgets
Filed with Nevada Tax Commission.

County	General expense	Indigent fund	Highways and streets	Educational	Bond redemption, interest, and debts	Estimated total expenditures	Revenue other than taxes	Revenue from taxes	Estimated tax rate
Churchill—General	\$56,960	\$8,100	\$9,000	\$64,060	\$7,200	\$146,310	\$24,350	\$120,960	\$1.344
City of Fallon	17,068		4,500		3,220	24,788	7,282	17,506	1.74
Special districts				16,116	16,562	31,668		31,668	
Totals	\$74,018	\$8,100	\$13,500	\$79,176	\$26,972	\$201,766	\$31,602	\$170,164	
Clark—General	\$63,800	\$3,586	\$24,100	\$67,062	\$38,012	\$196,500	\$31,800	\$154,700	\$1.75
City of Las Vegas	7,861		4,000		3,060	14,421	4,200	10,221	.7684
Special districts	10,709			84,147	8,616	53,371		53,371	
Totals	\$71,870	\$3,586	\$28,100	\$101,199	\$49,687	\$254,292	\$36,000	\$218,292	
Douglas—General	\$21,780	\$2,000	\$19,800	\$34,675	\$17,200	\$96,455	\$16,655	\$78,800	\$1.97
Special districts	1,300			2,880	770	4,950		4,950	
Totals	\$23,080	\$2,000	\$19,800	\$37,555	\$17,970	\$100,405	\$16,655	\$83,750	
Elko—General	\$146,000	\$18,700	\$154,700	\$181,620	\$35,060	\$535,980	\$74,700	\$461,280	\$1.037
City of Elko	21,025		9,800		16,180	47,005	14,179	32,826	1.26
Special districts				33,046	22,818	55,864		55,864	
Totals	\$167,025	\$18,700	\$164,500	\$214,666	\$74,068	\$638,849	\$88,879	\$550,970	
Emeralda—General	\$48,000	\$12,000	\$10,228	\$32,000	\$10,171	\$107,399	\$18,479	\$88,920	\$1.71
Special districts	8,047			2,540	7,650	18,237		18,237	
Totals	\$56,047	\$12,000	\$10,228	\$34,540	\$17,821	\$125,636	\$18,479	\$107,157	
Eureka—General	\$45,474	\$3,275	\$23,659	\$31,277		\$108,685	\$10,343	\$98,342	\$1.315
Special districts	720				\$871	1,591		1,591	
Totals	\$46,194	\$3,275	\$23,659	\$31,277	\$871	\$105,276	\$10,343	\$94,933	
Humboldt—General	\$68,000	\$10,000	\$54,000	\$56,350	\$45,091	\$227,441	\$49,621	\$177,820	\$0.9855
City of Winnemucca	18,102		20,000		6,000	44,102	10,350	33,752	1.465
Special districts				7,573	2,280	9,853		9,853	
Totals	\$86,102	\$10,000	\$74,000	\$63,923	\$53,371	\$231,396	\$59,971	\$221,425	
Lander—General	\$51,600	\$6,400	\$17,600	\$20,100		\$97,700	\$9,500	\$88,200	\$1.26
Special districts			4,500	6,025	\$2,408	12,953		12,928	
Totals	\$51,600	\$6,400	\$22,100	\$26,125	\$2,408	\$110,658	\$9,500	\$101,158	

Lincoln—General.....	\$33,644	\$4,198	\$12,000	\$51,723	\$50,000	\$151,553	\$52,853	\$98,700	\$1.20
Special districts.....	600			7,212	680	8,492		8,492	
Totals.....	\$34,244	\$4,198	\$12,000	\$58,935	\$50,680	\$160,045	\$52,853	\$107,192	
Lyon—General.....	\$61,625	\$11,500	\$77,000	\$37,450	\$6,500	\$194,075	\$33,950	\$160,125	\$1.4574
City of Yerlington.....	53,850		3,000		9,533	66,383	56,458	9,925	1.50
Special districts.....				42,589	6,649	49,238		49,238	
Totals.....	\$115,475	\$11,500	\$80,000	\$80,039	\$22,682	\$309,696	\$90,408	\$219,288	
Mineral—General.....	\$43,905	\$10,250	\$24,500	\$24,500	\$13,970	\$117,125	\$21,350	\$95,775	\$1.9155
Special districts.....				1,380		1,380		1,380	
Totals.....	\$43,905	\$10,250	\$24,500	\$25,880	\$13,970	\$118,505	\$21,350	\$97,155	
Nye—General.....	\$118,780	\$6,000	\$22,000	\$31,250	\$3,180	\$241,210	\$72,010	\$169,200	\$1.41
Special districts.....	18,000	16,000		19,730	5,900	59,630		59,630	
Totals.....	\$136,780	\$6,000	\$38,000	\$110,980	\$9,080	\$300,840	\$72,010	\$228,830	
Ormsby—General.....	\$18,000	\$4,500	\$12,250	\$26,500	\$66,302	\$127,552	\$38,088	\$44,464	\$2.6155
City of Carson.....	8,500		5,500		-5,000	19,000	7,800	20,008	1.06
Special districts.....					2,250	2,250		2,250	
Totals.....	\$26,500	\$4,500	\$17,750	\$26,500	\$73,552	\$148,802	\$90,888	\$57,914	
Pershing—General.....	\$46,717	\$6,300	\$26,000	\$45,700	\$17,500	\$142,217	\$16,217	\$126,000	\$0.90
City of Lovelock.....	19,500		4,318		13,040	37,358	17,350	20,008	1.70
Special districts.....				11,114	16,435	27,569		27,569	
Totals.....	\$66,217	\$6,300	\$30,318	\$56,814	\$47,025	\$207,174	\$33,567	\$173,607	
Storey—General.....	\$22,945	\$3,944	\$1,200	\$15,312		\$48,401	\$9,495	\$38,906	\$2.075
Special districts.....	9,788			1,315		11,103		11,103	
Totals.....	\$32,733	\$3,944	\$1,200	\$16,627		\$59,504	\$9,495	\$50,009	
Washoe—General.....	\$165,950	\$33,600	\$37,800	\$183,820	\$51,315	\$622,455	\$98,370	\$434,115	\$1.3155
City of Reno.....	171,692		333,941		98,367	544,000	403,549	140,451	1.00
City of Sparks.....	13,770		15,110		3,842	32,722	10,613	22,109	.90
Special districts.....				59,283	44,635	103,918		103,918	
Totals.....	\$351,412	\$33,600	\$436,851	\$243,103	\$136,159	\$1,208,125	\$502,533	\$700,593	
White Pine—General.....	\$112,756	\$30,000	\$65,000	\$112,748	\$32,000	\$352,504	\$60,504	\$292,000	\$1.46
City of Ely.....	20,752		10,310		3,200	34,762	12,500	22,262	1.75
Special districts.....				33,537	14,341	47,878		47,878	
Totals.....	\$133,508	\$30,000	\$75,310	\$146,285	\$49,541	\$435,144	\$73,004	\$362,140	
Grand totals for 1919.....	\$1,506,710	\$181,291	\$1,072,316	\$1,352,524	\$647,742	\$4,761,063	\$1,217,536	\$3,543,547	
Grand totals for 1920.....	\$1,225,280	\$197,326	\$680,577	\$1,163,979	\$550,955	\$3,818,097	\$856,440	\$2,961,657	

TABLE No. 6
Assessed Valuations of Railroads and Public Utilities, 1919-1920*
INTERSTATE AND INTERCOUNTY RAILROADS

Name of railroad	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Atchison, Topeka and Santa Fe Railway.....	11.60	12.69	\$67,667	\$60,900
Bullfrog and Goldfield Railroad.....	78.95	84.53	316,666	226,000
Central Pacific Railway.....	744.779	978.339	43,025,145	38,722,631
Los Angeles and Salt Lake Railroad.....	266.94	325.83	11,444,400	10,299,960
Nevada Northern Railway.....	167.896	195.90	5,041,627	4,537,464
Tonopah and Goldfield Railroad.....	95.053	113.219	1,700,000	1,721,135
Tonopah and Tidewater Railroad.....	29.47	29.98	142,300	128,079
Virginia and Truckee Railway.....	67.00	83.84	900,000	810,000
Western Pacific Railway.....	449.20	501.69	14,330,460	12,897,414
Totals.....	1,910.878	2,325.918	\$76,968,265	\$69,462,574

INTRACOUNTY RAILROADS

Name of railroad	Main track mileage	All track mileage	Assessed 1920	Assessed 1919
Eureka-Nevada Railway.....	85.60	88.10	\$153,411.00	\$138,075.00
Nevada Central Railroad.....	98.00	96.00	125,000.00	112,500.00
Nevada Copper Belt Railroad.....	41.47	44.47	210,000.00	225,000.00
Pioche-Pacific Railroad.....	15.00	17.50	25,000.00	22,500.00
Totals.....	239.07	245.07	\$513,411.00	\$498,075.00

INTERSTATE AND INTERCOUNTY PUBLIC UTILITIES

Class	Assessed 1920	Assessed 1919
Electric companies.....	\$4,927,412.00	\$4,434,671.00
Express companies.....	220,292.00	198,262.00
Private car-line companies.....	521,562.00	399,255.00
Sleeping-car companies.....	740,206.00	557,445.00
Telephone and telegraph companies.....	2,375,969.00	2,128,679.00
Water companies.....	215,550.00	194,850.00
Totals.....	\$9,000,991.00	\$7,913,162.00

*For detailed statement of valuations of railroads and public utilities, and apportionment of same to counties, see appendix.

INTRACOUNTY PUBLIC UTILITIES

Class	Assessed 1920	Assessed 1919
Electric and gas companies	\$1,109,408.00	\$998,917.00
Electric railroads	71,687.00	75,000.00
Telephone and telegraph companies	147,118.00	132,407.00
Water companies	1,600,387.00	1,467,347.00
Totals	\$2,928,580.00	\$2,663,671.00

GENERAL RECAPITULATION

Class	Assessed 1920	Assessed 1919
Interstate and intercounty railroads	\$76,968,265.00	\$69,462,574.00
Intracounty railroads	518,411.00	498,075.00
Totals	\$77,481,676.00	\$69,960,649.00
Interstate and intercounty utilities	\$9,000,991.00	\$7,913,162.00
Intracounty utilities	2,928,580.00	2,663,671.00
Totals	\$11,929,571.00	\$10,576,833.00
Grand totals	\$89,411,247.00	\$80,537,482.00

TABLE No. 7
Statement Showing Classes and Valuations of Privately Owned Lands by Counties for the Years 1919-1920

County	Cultivated land*				Meadow land				Pasture land				Arable land			
	Acres	Average value per acre	Valuation	Acres	Average value per acre	Valuation	Acres	Average value per acre	Acres	Average value per acre	Valuation	Acres	Average value per acre	Valuation	Acres	Average value per acre
Churchill	25,316	\$57.89	\$1,455,650	446	\$18.32	\$8,172	12,746	\$15.49	15,344	\$12.14	\$197,455	15,344	\$12.14	\$186,318		
Clark	23,322	69.60	1,623,170				4,501	14.00	24,788	10.42	62,997	24,788	10.42	258,392		
	5,896	52.01	309,711				1,267	12.46	108,635	4.42	15,795	108,635	4.42	480,238		
	5,461	63.32	346,779				1,235	11.89	14,684	6.46	14,684	91,223	6.46	496,764		
Douglas	15,554	62.15	966,640	1,693	30.00	50,790	18,462	19.44	358,813	9.88	358,813	5,678	9.88	56,100		
	15,773	72.11	1,137,435	1,670	38.87	64,920	18,462	23.88	441,463	8.72	441,463	5,678	8.72	46,948		
Elko	17,688	36.05	637,738	108,143	29.54	3,046,875	108,143	15.00	1,561,780	8.00	1,561,780	2,591	8.00	20,728		
	17,636	40.48	713,990	100,554	34.62	3,480,366	100,554	17.50	1,819,125	14.00	1,819,125	4,562	14.00	63,875		
Emeralda	1,052	41.50	43,658	330	18.00	5,940	1,109	7.00	7,768							
	1,097	45.81	50,259	330	20.00	6,600	1,069	7.80	8,338							
Eureka	1,636	37.94	62,608	6,395	18.13	115,923	8,451	12.93	109,289	8.15	86,560	6,560	8.15	53,487		
	1,596	48.89	78,140	6,614	28.62	188,961	7,394	11.22	83,017	9.98	83,017	6,778	9.98	67,577		
Humboldt	11,220	37.89	425,174	39,754	20.68	818,950	69,869	8.96	627,632	10.82	750,961	4,823	10.82	52,171		
	11,509	43.24	497,665	40,026	23.52	936,840	70,852	10.60	750,961	13.62	1,031,515	3,768	13.62	51,315		
Lander	2,682	35.58	94,420	4,642	17.96	83,554	8,706	8.46	73,636	7.50	65,494	53,494	7.50	401,549		
	2,750	39.12	107,586	10,685	20.00	213,700	25,187	10.98	276,319	16.00	414,780	49	16.00	780		
Lincoln	1,737	50.00	86,850	1,888	17.00	32,266	2,708	14.00	37,812							
	2,058	55.84	114,928	2,032	30.79	62,556	3,594	14.90	53,563	13.64	73,812	333	13.64	4,543		
Lyon	29,385	69.40	2,043,515	1,905	19.18	36,534	30,243	20.77	628,166	11.35	342,245	43,245	11.35	490,770		
	28,348	71.72	2,033,170	1,563	24.62	38,487	31,978	18.73	599,058	11.44	342,245	44,175	11.44	505,928		
Mineral	1,866	61.56	114,928	1,750	23.75	40,740	1,575	20.00	31,500	5.00	15,750	6,759	5.00	3,798		
	1,891	67.31	127,286	1,739	37.37	64,986	1,570	26.00	40,820	8.28	32,657	4,821	8.28	4,064		
Nye	3,657	57.22	209,256	6,125	26.26	160,852	7,031	15.83	111,297	15.11	107,297	296	15.11	4,527		
	3,607	49.68	179,187	5,978	23.11	138,165	6,857	20.50	140,500	10.56	140,500	1,963	10.56	20,680		
Ormsby	1,248	69.21	86,690	126	30.00	3,780	561	20.50	11,500	11.08	12,611	1,967	11.08	21,789		
	1,332	72.58	96,673	126	25.46	3,208	593	23.49	14,114	11.61	16,529	22,720	11.61	263,776		
Pershing	23,680	60.50	1,389,995	860	19.82	17,060	6,981	13.49	93,629	18.42	170,629	22,720	18.42	498,133		
	15,826	57.45	909,272	974	25.07	24,420	7,671	11.21	86,957	16.41	125,686	26,767	16.41	438,133		
Storey	553	64.79	35,880	50	18.00	900	73	7.00	511							
	506	86.77	43,402	132	21.89	28,995	132	11.73	1,548	9.00	1,548	17	9.00	153		
Washoe	30,891	70.51	2,176,380	3,467	21.89	75,895	21,430	21.83	467,020							
	27,374	81.65	2,235,144	3,104	40.34	125,280	20,941	27.60	577,870							
White Pine	9,018	47.76	430,620	6,708	27.18	182,836	18,118	15.81	286,134	7.62	139,617	369	7.62	2,751		
	9,258	57.89	536,916	6,451	33.51	215,202	13,927	16.41	228,586							
Totals	181,669	\$56.07	\$10,185,871	179,178	\$28.05	\$4,687,370	302,376	\$14.58	\$4,096,557			286,134	\$7.65	\$2,096,089		
	180,394	64.20	10,810,061	182,011	33.51	5,067,780	320,104	16.15	5,169,717			210,839	9.68	2,019,088		

*Included in cultivated land in above table are special lands as follows: Churchill County 110 acres, Clark County 163 acres, and Washoe County 1,890 acres.

TABLE NO. 7—Continued

County	Grazing land			Mountain land			Special land			Unclassified		
	Acres	Value per acre	Valuation	Acres	Value per acre	Valuation	Acres	Value per acre	Valuation	Acres	Value per acre	Valuation
Churchill.....	18,552	\$6.00	\$111,544	10,421	\$1.25	\$13,026	153	\$100.00	\$15,300			
.....	19,854	5.51	109,305	11,537	2.00	23,274	110	106.18	11,680			
Clark.....	7,695	4.81	36,978	14,839	1.25	18,839	153	100.16	15,325			
.....	51,732	3.40	175,831	18,000	2.06	37,060	153	120.06	18,370			
Douglas.....	13,320	5.75	76,590	112,249	2.00	224,498	c171	60.00	10,260			
.....	13,088	5.89	77,135	112,009	2.00	224,018						
Elko.....	1,192,899	3.40	4,059,223									
.....	1,192,899	3.40	4,059,223									
.....	1,341,526	3.81	5,106,382									
Emeralda.....	983	4.55	4,475	11,713	1.32	15,425						
.....	983	5.11	5,020	11,259	1.43	16,070						
Eureka.....	44,702	3.77	168,725	340	1.25	425						
.....	43,703	4.78	206,841	6,113	2.00	10,226						
Humboldt.....	370,780	3.49	1,294,240	943	1.25	1,179						
.....	371,869	3.86	1,436,376	968	1.25	1,179						
Lander.....	64,301	5.44	349,616	12,790	1.25	15,988						
.....	72,660	6.68	485,083	20,230	1.40	28,320						
Lincoln.....	9,892	3.65	36,106	18,336	1.25	22,920						
.....	10,256	4.41	45,226	22,213	2.00	44,426						
Lyon.....	14,689	7.44	109,257	89,824	1.25	49,480						
.....	20,582	6.69	137,636	21,224	1.99	42,226						
Mineral.....	330	10.00	3,300	55,191	1.25	66,999						
.....	934	6.43	6,002	55,705	1.40	77,986						
Nye.....	119,898	3.31	397,149	4,239	1.25	5,299	5	100.00	500			
.....	123,290	3.73	460,121	3,557	1.69	5,999						
Ormsby.....	28,302	3.12	88,370									
.....	28,342	3.60	101,987									
Pershing.....	71,075	3.52	250,059									
.....	87,885	3.87	339,913	1,625	1.25	1,906						
Storey.....	732	3.75	2,744	1,620	1.25	1,900						
.....	1,390	6.42	8,929	1,635	2.00	3,270						
Washoe.....	387,531	2.81	1,087,850	19,574	1.25	24,510	6,996	102.97	617,445			
.....	400,132	2.81	1,123,648	19,499	1.25	24,375	1,890	126.00	238,260			
White Pine.....	96,555	2.92	281,960	33,213	1.25	41,516						
.....	73,570	4.00	294,104	66,085	2.00	131,542						
Totals.....	2,442,266	\$3.42	\$8,358,176	336,757	\$1.50	\$503,961	6,478	\$101.67	\$658,830	73,526	\$6.63	\$509,378
.....	2,661,796	3.80	10,121,549	369,110	1.81	669,971	2,153	123.62	268,310	73,396	7.97	584,720

*Dunphy lands. bPossessory claims. cLake Tahoe shore lands.

TABLE No. 8
Comparative Statement of Privately Owned Lands For the State As a Whole by Classes for the Years 1919-1920

Class	Acres	Per cent of total acreage of State	Increase or decrease in acreage	Value per acre	Assessed valuation	Per cent of total valuation	Increase or decrease in valuation
Special lands (Cultivated)	1919 2,307			\$102.83	\$248,570		
Cultivated—1st class	1920 2,133		b1,164	123.62	268,310		b\$380,260
Cultivated—2d class	1919 12,434		384	107.23	1,318,866		255,613
Cultivated—2d class	1920 12,818				1,374,578		
Cultivated—3d class	1919 68,366		b31,667	81.86	5,441,280		b1,484,001
Cultivated—3d class	1920 98,729				8,007,223		
Cultivated—4th class	1919 48,149		27,749	49.97	2,256,261		1,966,139
Cultivated—4th class	1920 72,898				4,222,400		
	1919 49,383		b5,667	34.86	1,720,846		216,669
	1920 43,796				1,987,544		
Total cultivated	1919 131,669	4.81		A.V. \$66.07	\$10,185,971	33.21	
	1920 166,394	4.23	c13,276	A.V. 64.20	10,810,061	30.92	d\$624,190
Meadow—1st class	1919 121,224			\$29.94	\$3,629,563		
Meadow—2d class	1920 119,374		b1,860	35.46	4,236,574		\$607,011
Meadow—2d class	1919 67,839			17.91	1,037,807		
Meadow—2d class	1920 62,637		4,698	21.57	1,361,166		313,349
Total meadow	1919 179,173	4.74		A.V. \$28.06	\$4,667,570	15.21	
	1920 182,011	4.57	d2,838	A.V. 30.70	5,667,780	15.96	d\$920,360
Pasture—1st class	1919 20,210			\$30.21	\$310,491		
Pasture—2d class	1920 8,809		b11,401	33.81	341,863		b\$268,635
Pasture—2d class	1919 164,791			16.97	2,580,918		51,521,419
Pasture—2d class	1920 171,837		b117,464	23.36	1,069,469		
Pasture—3d class	1919 70,172			11.61	367,396		2,383,510
Pasture—3d class	1920 205,109		185,937	15.61	8,191,368		
Pasture—4th class	1919 67,203		10,646	7.16	410,462		166,607
Pasture—4th class	1920 67,849			8.21	577,069		
Total pasture	1919 302,876	8.00		A.V. \$14.56	\$4,409,657	14.37	
	1920 320,104	8.08	d17,728	A.V. 16.16	5,169,717	14.80	d\$760,060
Arable—1st class	1919 29,656			\$14.76	\$437,233		
Arable—2d class	1920 16,896		b12,761	24.06	406,876		b\$80,908
Arable—2d class	1919 88,010			9.34	551,102		b46,608
Arable—2d class	1920 89,946		b28,064	16.81	804,544		
Arable—3d class	1919 177,468			6.90	1,071,008		b\$74,606
Arable—3d class	1920 70,446		b107,068	6.57			

Arable—4th class	1919	1920	90,593	90,593	4.80	434,561	434,561
Total arable	1919	1920	266,134	7.04	A.V. \$7.65	\$2,036,089	6.64
	1920		210,539	5.23	A.V. 9.58	2,019,068	6.77
Grazing—1st class	1919		6,081		\$14.71	\$89,424	
	1920		4,801		18.98	81,633	
Grazing—2d class	1919		22,339		10.09	225,946	
	1920		12,026		12.55	150,923	
Grazing—3d class	1919		647,786		5.00	3,237,141	
	1920		576,062		6.08	3,502,697	
Grazing—4th class	1919		982,665		3.09	2,879,162	
	1920		868,629		3.64	3,162,148	
Grazing—5th class	1919		833,435		2.31	1,925,513	
	1920		1,200,778		2.69	3,224,243	
Total grazing	1919		2,442,266	64.57	A.V. \$3.42	\$3,363,176	27.24
	1920		2,661,796	66.78	A.V. 3.80	10,121,549	23.96
Mountain (one class only)	1919		336,757	8.90	A.V. \$1.50	\$503,961	1.64
Special	1920		369,110	9.28	A.V. 1.81	669,971	1.52
	1919		*171	.00	A.V. 60.00	10,260	.03
Unclassified	1920		73,626	1.94	A.V. 6.93	509,373	1.66
	1919		73,396	1.84	A.V. 7.97	584,720	1.66
Grand totals	1919		3,782,072	100.00	A.V. \$3.11	\$30,680,762	100.00
	1920		3,865,650	100.00	A.V. 8.77	34,962,836	100.00

*Lake Tahoe shore lands in Douglas County. bDecrease. cNet decrease. dNet increase.

TABLE No. 10
Comparative Statement of Privately Owned and Railroad Lands by Counties for the Years 1919-1920

County	Privately owned lands						Railroad lands						
	Acres	Value per acre	Assessed valuation	Increase or decrease in acres	Increase or decrease in valuation	Per cent increase or decrease in valuation	Acres	Value per acre	Assessed valuation	Increase or decrease in acres	Increase or decrease in valuation	Per cent increase or decrease in valuation	
Churchill	1919	82,855	\$23.92	\$1,982,165	1,247	\$84,973	4.79	441,319	\$2.17	\$957,890			
	1920	84,102	24.70	2,077,138				496,564	2.34	1,021,963	4,755	\$64,073	6.80
Clark	1919	137,922	6.11	842,561									
	1920	137,922	6.39	1,070,890	29,747	228,259	27.09						
Douglas	1919	167,669	10.43	1,743,691									
	1920	167,127	11.97	1,980,979	*630	247,288	14.18						
Elko	1919	141,773	6.56	9,316,342				1,234,459	2.33	2,885,577			
	1920	158,228	7.13	11,183,728	148,455	1,867,386	20.04	1,163,683	2.56	2,985,027	*70,776	99,450	3.45
Emeralda	1919	15,187	6.09	77,282									
	1920	14,728	5.85	86,287	*449	9,025	11.68						
Eureka	1919	141,610	6.98	987,747				256,385	1.99	508,945			
	1920	143,593	8.01	1,149,492	1,983	161,746	16.38	255,826	2.01	612,336	*559	3,991	.78
Humboldt	1919	497,459	6.52	3,241,484				637,938	1.76	1,124,136			
	1920	497,987	7.41	3,697,026	1,508	455,542	14.06	633,675	1.92	1,216,817	4,263	92,681	8.24
Lander	1919	146,615	6.95	1,018,763				346,112	2.05	708,560			
	1920	131,561	8.45	1,111,738	*15,054	92,975	9.13	344,464	2.30	791,333	*1,648	82,773	11.68
Lincoln	1919	34,571	6.25	216,054									
	1920	40,496	8.03	325,242	5,915	109,188	50.54						
Lyon	1919	159,291	22.61	3,069,732				112,893	2.84	321,074			
	1920	147,870	19.29	3,355,905	*11,421	286,173	9.68	111,774	2.87	321,074	*1,119		
Mineral	1919	61,451	4.09	251,541									
	1920	62,330	5.15	321,144	879	69,603	27.67						
Nye	1919	140,841	5.72	805,565									
	1920	143,955	6.60	950,201	3,114	144,636	17.95						
Ormsby	1919	32,190	6.55	210,970				1,955	2.40	4,690			
	1920	32,350	7.35	237,771	160	26,801	12.70	911,198	1.67	1,523,404	*22,347	566	12.07
Pershing	1919	125,741	15.88	1,996,295				888,851	1.78	1,581,680			
	1920	139,123	13.32	1,852,685	13,382	*143,600	*7.19	74,615	1.95	145,512			
Storey	1919	2,928	41.883	121,883				75,492	2.94	221,725			
	1920	3,680	15.57	57,302	752	15,417	36.81	224,382	1.63	364,770	877	76,213	52.38
Washoe	1919	482,893	8.26	3,823,655				218,312	1.63	356,090	*6,070	*8,680	2.38
	1920	471,050	8.67	4,086,267	8,157	262,612	6.87						
White Pine	1919	153,618	6.93	1,065,050									
	1920	169,651	8.31	1,409,101	16,033	344,051	32.30						
Totals	1919	3,782,072	Av. \$8.11	\$30,680,762				4,241,256	\$2.01	\$8,544,558			
	1920	3,955,550	Av. 8.77	34,962,836	*209,578	*\$4,282,074	*13.95	4,130,596	2.18	9,013,901	*110,660	*\$469,343	*5.49

a. Decrease. b. Net decrease. c. Net increase.

TABLE No. 11
Statement by Counties and Classes of Live Stock for Years 1919-1920

County	Cattle (Including all calves born in 1919)				Other cattle		Bulls		Milch cows	
	Number	Value per head	Valuation	Number	Value per head	Valuation	Number	Value per head	Number	Value per head
Churchill	1919 7,583	\$38.00	\$288,164				161	\$100.00		\$16,100
	1920 6,882	37.00	254,664						882	\$76.00
Clark	1919 5,358	37.00	198,306	31	\$40.00	\$1,260	72	109.03		7,860
	1920 5,204	37.00	192,548						113	76.00
Douglas	1919 12,214	38.00	460,332				191	100.00		19,100
	1920 10,841	37.00	401,117						1,310	76.00
Eiko	1919 106,866	38.00	4,063,508	627	71.76	44,985	2,641	98.87		251,242
	1920 92,863	37.00	3,437,300				39	100.00		3,900
Emeralda	1919 2,635	38.00	100,130				156	100.00		15,600
	1920 2,102	37.00	78,287				961	100.00		96,100
Eureka	1919 12,102	37.00	447,884				184	100.00		18,400
	1920 8,325	37.00	308,033				337	100.00		33,700
Humboldt	1919 43,967	37.00	1,627,859				212	100.00		21,200
	1920 38,408	37.00	1,421,104				48	100.00		4,800
Lander	1919 15,546	38.00	586,548				583	100.45		58,565
	1920 15,532	37.00	576,296				19	100.00		1,900
Lincoln	1919 20,890	37.00	772,434				194	100.00		19,400
	1920 19,561	37.00	728,409				4	100.00		400
Lyon	1919 12,742	37.00	471,556				308	100.00		30,800
	1920 12,671	37.00	468,845				380	102.76		38,060
Mineral	1919 2,564	37.00	94,822				6,390	\$99.86		\$638,107
	1920 2,531	37.00	93,657							
Nye	1919 25,931	37.00	959,778							
	1920 23,583	37.00	872,781							
Ormsby	1919 264	37.00	9,799							
	1920 7,749	37.00	287,422							
Pershing	1919 10,074	37.00	372,864							
	1920 14,820	37.00	548,340							
Storey	1919 14	37.00	518							
	1920 14,820	37.00	548,340							
Washoe	1919 14,820	37.00	548,340							
	1920 12,873	37.00	476,301							
White Pine	1919 10,662	37.00	394,484							
	1920 802,498	\$38.00	\$30,494,157							
Totals	1919 208,492	\$7.00	10,387,306	4,079	\$45.97	\$187,518	7,020	\$75.00		\$525,460
	1920									

TABLE No. 11—Continued

County	Horses, Work (1,100 pounds and up)			Horses, Work (1,100 pounds and less)*			Horses, Saddle			Horses, Stock		
	Number	Value per head	Valuation	Number	Value per head	Valuation	Number	Value per head	Valuation	Number	Value per head	Valuation
Churchill	248	\$89.60	\$22,220	256	\$50.00	\$12,800	1,049	\$90.00	\$83,920	1,144	\$90.00	\$24,320
1919	1,021	86.12	87,920	182	75.42	6,185	1,302	55.00	16,610	1,413	31.84	45,242
1920	291	80.80	23,515	145	44.66	6,475	75	38.40	2,900	44	42.80	1,215
Clark	677	74.36	50,350	30	79.15	6,965	163	55.00	8,985	36	49.80	3,585
1919	473	42.570	20,110	188	75.00	14,475	124	49.54	6,190	510	50.00	25,400
1920	2,707	101.75	275,540	84	70.11	6,580	181	55.00	10,120	455	50.00	22,800
Elko	2,564	89.96	230,655	805	46.62	37,530	2,040	49.74	101,465	6,999	50.00	174,925
1919	88.57	3,720	4,970	1,493	47.08	82,115	1,493	55.00	82,115	5,898	30.01	117,810
1920	39	51.0	2,000	11	55.00	610	13	55.00	715	75	20.38	1,580
Emeralda	304	80.00	24,320	870	10.00	3,700	234	40.00	9,360	238	30.00	7,140
1919	360	80.00	28,800	75	62.53	4,565	259	55.00	14,275	265	30.00	7,950
1920	1,122	90.00	100,980	75	62.53	4,565	676	54.98	37,155	8,275	34.17	108,925
Humboldt	1,099	100.00	109,900	75	62.53	4,565	900	55.00	49,500	2,518	33.00	83,594
1919	871	80.00	70,480	800	79.00	23,757	302	50.33	15,200	2,782	30.00	23,460
1920	82	90.00	7,380	146	75.00	10,950	262	55.00	14,510	875	30.00	26,250
Lander	235	90.00	21,150	146	75.00	10,950	305	55.00	16,775	1,658	40.00	6,630
1919	1,478	80.00	118,240	112	60.00	6,720	195	50.00	9,750	900	17.00	3,015
1920	1,194	100.00	119,400	143	75.00	10,725	273	60.00	16,380	759	30.00	22,770
Mineral	145	73.44	10,650	110	75.00	8,250	54	43.62	2,330	175	25.77	4,510
1919	510	77.15	39,335	221	45.48	10,035	158	43.70	6,880	232	21.68	5,030
1920	409	90.10	36,850	114	79.25	9,038	557	59.15	32,995	1,148	29.64	34,030
Ormsby	115	81.39	9,380	25	54.00	1,300	658	59.21	37,655	1,237	29.75	36,795
1919	75	90.00	6,750	43	75.00	3,225	15	48.33	775	64	55.89	3,565
1920	880	79.31	69,800	50	55.00	2,750	28	55.00	1,540	68	30.00	2,040
Pershing	825	90.00	74,250	34	50.00	1,700	182	50.23	9,141	357	36.61	13,071
1919	51	50.00	2,550	43	75.00	3,225	115	25.00	2,875	544	17.00	9,248
1920	10	90.00	900	43	75.00	3,225	18	55.00	990	---	---	---
Storey	1,043	90.81	94,710	244	60.14	14,675	451	52.84	23,835	1,057	35.42	58,688
1919	1,090	90.12	98,190	194	60.23	11,684	417	56.12	23,404	1,465	31.95	46,492
1920	1,544	68.34	37,175	17	48.33	830	230	40.32	9,270	1,670	29.94	26,050
White Pine	10,763	\$98.71	\$983,295	746	77.15	57,580	238	54.00	12,852	614	13.00	8,580
1919	9,239	91.67	851,540	1,681	\$44.15	\$73,840	6,503	\$55.33	\$359,850	18,449	\$29.83	\$550,409
1920	10,763	91.67	851,540	3,140	67.25	211,269	5,638	55.78	314,539	15,850	26.49	446,236

*Buggy horses for year 1919 considered in this table as light work-horses, 1,100 pounds and less.

REPORT OF NEVADA TAX COMMISSION

TABLE NO. 11—Continued

County	Stallions			Brood Mares			Mules, Work			Mules, Stock		
	Number	Value per head	Valuation	Number	Value per head	Valuation	Number	Value per head	Valuation	Number	Value per head	Valuation
Churchill.....	15	\$196.60	\$2,949	32	\$100.00	\$3,200	90	\$88.89	\$8,000	165	\$30.00	\$4,950
1919	7	200.00	1,400	27	100.00	2,700	48	90.00	4,320	150	43.65	6,545
Clark.....	6	100.00	600				32	66.71	2,135			
1919	4	200.00	800							24	69.42	1,450
Douglas.....	3	200.00	600				21	50.00	1,050			
1920	3	200.00	600							22	56.00	1,100
Elko.....	156	137.66	21,475	50	40.00	2,000	86	92.27	7,935	233	32.75	7,632
1919	121	139.00	22,870	50	40.00	2,000	68	96.87	6,040	134	42.16	5,650
1920	1	100.00	100	17	50.00	850				12	58.75	705
Esmeralda.....	1	200.00	200	17	50.00	850				25	65.20	1,630
1919	15	100.00	1,500	99	30.00	2,970	45	80.00	3,600	105	30.00	3,150
1920	11	200.00	2,200	47	30.00	1,410	42	80.00	3,360	75	30.00	2,250
Eureka.....	54	231.00	12,475									
1919	49	252.05	12,350									
Humboldt.....	27	100.00	2,700	190	30.00	5,700	27	80.00	2,160	65	30.00	1,950
1919	27	100.00	2,700	91	50.00	4,550				73	41.00	3,005
Lander.....	26	198.00	5,150				36	50.00	1,800			
1920	9	200.00	1,800	138	50.00	6,900	4	90.00	360			
Lincoln.....	7	214.30	1,500	173	50.00	8,650	62	80.00	4,960	86	50.00	1,800
1920	18	168.00	3,000				34	100.00	3,400	37	30.00	1,110
Lyon.....	18	250.00	4,500				2	75.00	150	74	50.00	3,690
1920	2	100.00	200				2	75.00	150	23	30.00	840
Mineral.....	3	100.00	300				17	82.94	1,410	18	28.88	520
1919	15	121.66	1,825	34	58.62	2,000	86	73.89	6,355	40	41.12	1,645
Nye.....	12	197.92	2,375	82	58.12	4,760	48	86.45	4,150	40	47.75	1,910
1920										6	51.66	310
Ormsby.....							2	90.00	180			
1919	16	160.63	2,570				61	59.18	3,610	45	56.88	2,560
Pershing.....	11	200.00	2,200	80	55.00	1,650	43	90.00	3,870	20	50.00	1,000
1920							2	50.00	100			
Storey.....							2	75.00	150			
1919							72	86.40	6,150	176	50.00	8,700
Washoe.....	26	272.88	7,095	65	64.92	4,220	96	91.97	8,830	212	44.48	9,420
1919	22	348.00	7,550	65	63.00	4,120				142	46.47	6,600
1920	21	147.88	3,096				71	85.00	6,100	55	50.00	2,750
White Pine.....	7	271.00	1,900									
Totals.....	388	\$161.87	\$61,884	625	\$44.64	\$27,940	632	\$77.17	\$48,005	1,054	\$38.10	\$40,182
1920	302	218.20	65,895	532	68.96	27,980	496	88.62	43,020	968	41.64	42,765

TABLE NO. 11—Continued

County	Jacks			Jennies			Burras			Goats		
	Number	Value per head	Valuation	Number	Value per head	Valuation	Number	Value per head	Valuation	Number	Value per head	Valuation
Churchill	1919											
	1920	\$166.66	\$1,060	27	\$25.00	\$675	19	\$10.00	\$190	81	\$3.50	108
Clark	1919	200.00	1,000	27	16.00	432	28	10.00	280			
	1920									600	3.50	2,100
Douglas	1919											
	1920											
Elko	1919	169.38	2,550	3	20.00	60	13	10.00	130			
	1920	188.46	2,450	8	16.00	48	197	20.00	3,940			
Esmeralda	1919	8 100.00	800	8			114	10.00	1,140	62	4.71	292
	1920	8 833.33	1,000	10	16.00	160				110	8.00	330
Eureka	1919	2 100.00	200							106	3.50	371
	1920	2 200.00	400				61	10.00	510			
Humboldt	1919	8 390.62	3,125				64	10.00	640			
	1920	9 406.60	3,660				94	10.00	940			
Lander	1919	7 100.00	700	16	10.00	160	77	10.00	770	10	8.00	80
	1920	7 100.00	700	4	16.00	64	31	6.00	186			
Lincoln	1919	4 200.00	800				39	10.00	390	4	3.50	14
	1920	3 200.00	600									
Lyon	1919	1 50.00	50				23	10.00	230	40	3.50	140
	1920						21	16.00	315			
Mineral	1919	2 100.00	200				17	10.00	170	10	3.50	35
	1920	4 150.00	600				10	12.00	120			
Nye	1919						8	10.00	80			
	1920						23	6.65	155	130		
Ormsby	1919						28	10.00	280	286	3.65	1,040
	1920											
Pershing	1919	5 150.00	750				14	10.00	140			
	1920	2 200.00	400				25	10.00	250			
Storey	1919											
	1920											
Washoe	1919	3 166.66	500	76	13.11	997				9	5.00	45
	1920	4 225.00	900				75	12.80	960			
White Pine	1919	3 116.66	350				379	6.64	2,508			
	1920	3 206.00	620				63	10.00	630	20	3.50	70
Totals	1919	\$168.95	\$10,475	122	\$15.51	\$1,882	533	\$13.12	\$6,929	110	\$3.00	\$380
	1920	\$224.00	\$12,320	44	16.09	704	566	10.37	5,870	1,177	8.65	4,236

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County	Sheep			Bucks			Hogs			Pigs		
	Number	Value per head	Valuation	Number	Value per head	Valuation	Number	Value per head	Valuation	Number	Value per head	Valuation
Churchill.....	27,783	\$9.00	\$250,047	496	\$12.00	\$5,952	555	\$12.00	\$6,780	425	\$4.00	\$1,700
Clark.....	31,005	8.00	248,040	617	12.00	7,404	254	12.00	3,048	461	5.00	2,306
.....	1,147	9.00	10,503	4	12.00	48	189	15.00	2,835	450	4.00	1,800
.....	1,533	8.00	12,064				466	12.00	5,592	1,311	5.00	6,544
Douglas.....	31,521	9.00	283,689	291	12.00	3,492	932	15.00	13,980	1,289	5.00	5,244
.....	31,431	8.00	251,928	320	12.00	3,840	788	12.00	9,456	1,312	5.00	5,244
Elko.....	268,225	9.00	2,414,025	2,873	12.00	34,476	714	15.00	10,710	1,312	5.00	5,244
.....	257,526	8.00	2,060,208	2,707	12.00	32,484	68	12.00	816	189	5.00	756
.....	113	9.00	1,017	2	12.00	24	21	15.00	315	28	4.00	112
.....	143	8.00	1,144	2	12.00	24	92	12.00	1,104	12	5.00	60
.....	39,781	9.00	358,029	720	12.00	8,640	92	12.00	1,104	60	5.00	265
Eureka.....	44,367	8.00	354,936	701	12.00	8,412	47	15.00	705	53	5.00	265
.....	147,575	9.00	1,328,175	2,125	12.00	25,500	353	12.00	4,236	171	4.00	684
Humboldt.....	153,182	8.00	1,225,456	1,720	12.00	20,640	332	15.00	4,980	73	5.00	365
.....	61,720	9.00	555,480	87	12.00	1,044	212	12.00	2,544	29	4.00	116
Lander.....	65,470	8.00	523,760	119	12.00	1,428	147	15.00	2,205	36	5.00	180
.....	30,063	9.00	270,748	60	12.00	720	149	12.00	1,788	236	4.00	944
Lincoln.....	27,150	8.00	217,200	111	12.00	1,332	175	15.00	2,625	205	5.00	1,025
.....	54,882	9.00	493,938	421	12.00	5,052	1,751	12.00	21,012	2,013	4.00	8,052
Lyon.....	63,194	8.00	425,552	202	12.00	2,424	1,598	15.00	23,970	2,040	5.00	10,200
.....	29,460	9.00	265,140	300	12.00	3,600	197	12.00	2,364	40	4.00	160
Mineral.....	26,485	8.00	211,880	300	12.00	3,600	197	12.00	2,364	28	5.00	140
.....	38,319	9.00	344,871	253	12.00	3,036	519	12.00	6,228	894	4.00	3,576
Nye.....	46,710	8.00	373,680	415	12.00	4,980	402	15.00	6,027	681	5.00	3,405
.....	3,770	9.00	33,930	35	12.00	420	54	12.00	648	134	4.00	536
Ormsby.....	3,610	8.00	28,800	23	12.00	276	95	15.00	1,425	124	5.00	620
.....	24,185	9.00	217,665	577	12.00	6,924	485	12.00	5,840	532	4.00	2,128
Pershing.....	48,465	8.00	387,720	844	12.00	10,128	210	15.00	3,150	355	5.00	1,775
.....	10	8.00	80				14	12.00	168	20	4.00	80
Storey.....	160,551	9.00	1,444,960	1,331	12.00	15,972	15	15.00	225	317	4.00	1,267
.....	147,481	8.00	1,180,125	2,356	12.00	28,272	670	12.00	8,042	817	5.00	3,268
Washoe.....	136,126	9.00	1,216,134	1,588	12.00	19,056	436	15.00	6,532	214	4.00	856
White Pine.....	131,228	8.00	1,049,824	2,177	12.00	26,124	337	15.00	4,005	228	5.00	1,140
Totals.....	1,054,241	\$9.00	\$9,488,351	11,153	\$12.00	\$133,886	7,073	\$12.00	\$84,878	7,142	\$4.00	\$28,567
.....	1,069,060	8.00	8,552,397	12,114	12.00	145,968	6,486	15.00	97,446	6,206	5.00	31,080

TABLE NO. 11—Continued

County	Poultry			Stands of Bees		
	Number	Value per head	Valuation	Number	Value per stand	Valuation
Churchill	1919 8,935	\$0.43	\$3,835	867	\$3.50	\$3,035
	1920 11,039	.52	5,764	1,110	5.00	5,550
Clark	1919			549	3.50	1,890
	1920 740	.50	370	128	5.00	640
Douglas	1919			308	3.50	1,078
	1920			278	5.00	1,390
Elko	1919 8,439	.50	4,208	230	3.50	758
	1920 8,022	.50	4,016	229	5.00	1,145
Esmeralda	1919 257	.40	102			
	1920 340	.50	170			
Eureka	1919					
	1920					
Humboldt	1919 3,045	.47	1,423	14	4.00	56
	1920 3,896	.50	1,962	65	5.00	325
Lander	1919 1,015	.40	415			
	1920 719	.51	362			
Lincoln	1919					
	1920 1,181	.52	613			
Lyon	1919			3,913	3.50	13,696
	1920			2,807	5.00	14,035
Mineral	1919			102	3.50	357
	1920					
Nye	1919 2,778	.40	1,141	71	3.50	248
	1920 2,458	.50	1,209	44	5.00	220
Ormsby	1919			8	3.50	28
	1920			75	5.00	375
Perushing	1919 3,904	.50	1,962	1,110	3.50	3,885
	1920			2,135	5.00	10,675
Storey	1919 1,060	.40	424			
	1920 800	.50	400			
Washoe	1919 15,782	.40	6,314	702	3.50	2,454
	1920 16,733	.50	8,367	533	5.00	2,668
White Pine	1919 2,793	.44	1,236			
	1920 2,800	.53	1,385			
Totals	1919 48,008	\$0.44	\$21,060	7,865	\$3.50	\$27,485
	1920 48,528	.51	24,598	7,404	5.00	37,023

TABLE No. 12

Recapitulation of Live Stock by Classes For the State as a Whole for Years 1919-1920

Class	Number	Value per head	Valuation
Cattle.....1919	302,498	\$38.00	\$11,494,157
.....1920	280,492	37.00	10,387,306
Other cattle.....1919	4,079	45.97	187,518
.....1920			
Bulls.....1919			
.....1920	6,390	99.86	638,107
Milch cows.....1919			
.....1920	7,020	74.85	525,490
Horses, work (1,100 pounds and up).....1919	10,768	86.71	933,295
.....1920	9,229	91.65	851,540
Horses, work (1,100 pounds and less).....1919	1,661	44.15	73,340
.....1920	3,140	67.28	211,269
Horses, saddle.....1919	6,508	55.33	359,850
.....1920	5,698	55.78	314,639
Horses, stock.....1919	18,448	29.83	550,409
.....1920	16,850	26.49	446,286
Stallions.....1919	358	161.57	61,894
.....1920	302	218.20	65,996
Brood mares.....1919	625	44.54	27,840
.....1920	532	63.95	27,630
Mules, work.....1919	622	77.17	48,005
.....1920	496	83.52	43,020
Mules, stock.....1919	1,054	39.10	40,182
.....1920	968	44.64	42,765
Jacks.....1919	62	168.95	10,475
.....1920	55	224.00	12,320
Jennies.....1919	122	15.51	1,892
.....1920	44	16.00	704
Burros.....1919	528	13.12	6,929
.....1920	566	10.87	5,870
Goats.....1919	110	3.00	330
.....1920	1,177	3.65	4,295
Sheep.....1919	1,054,241	9.00	9,488,351
.....1920	1,069,060	8.00	8,552,397
Bucks.....1919	11,153	12.00	133,836
.....1920	12,114	12.00	145,368
Hogs.....1919	7,073	12.00	84,876
.....1920	6,488	15.00	97,446
Pigs.....1919	7,142	4.00	28,567
.....1920	6,206	5.00	31,030
Poultry.....1919	48,096	.44	21,050
.....1920	48,528	.51	24,598
Stands of bees.....1919	7,865	3.50	27,455
.....1920	7,404	5.00	37,023
Totals.....1919			\$23,560,243
.....1920			22,464,906

TABLE No. 13
Valuation of All Properties by Classes For the Years 1919-1920

Class	Assessed valuation	Per cent	Assessed valuation	Per cent
Privately owned land	\$30,680,762	15.47	\$34,962,836	16.49
Railroad land	8,544,558	4.31	9,013,901	4.25
Live stock	23,580,243	11.89	22,464,908	10.59
Railroads	70,183,903	35.41	77,296,053	36.46
Public utilities	10,460,812	5.27	11,940,877	5.63
Net proceeds of mines	4,480,441	2.26	3,479,206	1.64
Mine improvements and patented claims	11,472,621	5.79	11,547,881	5.45
Town property (real and improvements)	20,800,864	10.49	20,532,954	9.68
Country property (improvements)	2,931,803	1.48	4,139,528	1.95
Water rights and pipe lines	483,096	.24	357,566	.17
Miscellaneous personal property	3,751,583	1.89	3,969,080	1.87
Merchandise	4,875,027	2.46	5,091,679	2.40
Banks	3,393,513	1.71	3,562,349	1.68
Motor vehicles	2,633,589	1.33	3,719,712	1.75
Totals	\$198,262,815	100.00	\$212,077,329	100.00

TABLE No. 14
State of Nevada Tax Levy

	Rates	
	1919	1920
<i>Fund</i>		
General .....	.3065	.3065
State Highway .....	.10	.10
Rabies .....	.018	.018
General School .....	.076	.076
University Contingent .....	.08	.08
<i>Bond Interest and Redemption Funds</i>		
Territorial .....	.01	.01
State Loan .....	.01	.015
General Appropriation .....	.001	.001
New Prison .....	.006	.006
Mental Hospital .....	.007	.007
Memorial Building .....	.006	.006
State Highway .....	.025	.025
Reclamation .....	.006	.01
University Agricultural Building .....	.006	.006
University Experiment Farm .....	.002	.002
University Teachers' Training Building .....	.005	.005
University Mining Experimentation .....		.002
University Engineering Experimentation .....		.002
Total State tax levy .....	.6805	.6745
<i>Special Statutes</i>		
Teachers' Retirement salary .....	.006	.006
Civics and Physical Training .....	.006	.006
Total State settlement rate .....	.6705	.6645
Special Stock Inspection tax .....	.002	
Special Sheep Inspection tax .....	.003	

TABLE No. 15
Financial Statement of Tax Commission

FOR THE YEAR 1919

<i>Receipts—</i>	
Annual appropriation, special fund	\$7,000.00
Annual appropriation, general fund	6,000.00
Deficiency appropriation	1,350.00
Total appropriations	\$14,350.00
<i>Expenditures—</i>	
Bonds for members of Commission	\$125.00
Salaries of members of Commission	2,563.33
Salary of Secretary	3,000.00
Traveling expenses of Commissioners	843.80
Office labor	3,600.00
Office supplies and expenses	677.41
Field labor	1,400.00
Traveling expenses field agent	1,602.08
Total expenditures	\$13,811.42
Balance of appropriations unexpended Dec. 31, 1919	\$538.58

FOR THE YEAR 1920

<i>Receipts—</i>	
Annual appropriation, special fund	\$7,000.00
Annual appropriation, general fund	6,000.00
Deficiency appropriation	3,450.00
Total appropriations	\$16,450.00
<i>Expenditures—</i>	
Bonds for members of Commission	\$100.00
Salaries of members of Commission	3,000.00
Salary of Secretary	3,000.00
Traveling expenses of Commissioners	1,141.72
Office labor	3,800.00
Office supplies and expenses	667.88
Field labor	2,883.00
Traveling expenses field agent	1,954.50
Total expenditures	\$16,447.10
Balance of appropriation unexpended Dec. 31, 1920	\$2.90

APPENDIX TO NEVADA TAX COMMISSION REPORT

Note—The figures in the following pages show the original assessments of railroads and public utilities, and apportionment of same to counties; they do not contain the changes made for purposes of equalization.

STATE OF NEVADA

BIENNIAL REPORT

OF THE

DEPARTMENT OF HIGHWAYS

1919=1920



CARSON CITY, NEVADA

STATE PRINTING OFFICE : : : JOE FARNSWORTH, SUPERINTENDENT

1921



LETTER OF TRANSMITTAL

STATE OF NEVADA
DEPARTMENT OF HIGHWAYS
CARSON CITY

To the Honorable EMMET D. BOYLE, Governor of the State of Nevada.

DEAR SIR: The undersigned, Directors of the Department of Highways appointed and acting under the provisions of the Nevada State Highway Law, herewith submit their second report, for the biennial period January 1, 1919, to November 30, 1920.

Through this report we have endeavored to set forth briefly the accomplishments of the Department on the construction of the State Highway System.

We wish to take this opportunity to thank you and the other state officers for their hearty cooperation in carrying on the wide activities of the Department, and, through this report, to express our appreciation and commendation of all the employees of the Department, who, through their loyalty and support, have contributed to such measure of success as has been attained.

JAMES M. LEONARD,
Chairman.
W. H. JOHNSTON,
Director.
GEO. A. CAMPBELL,
Director.

PERSONNEL OF DEPARTMENT OF HIGHWAYS

BOARD OF DIRECTORS

JAMES M. LEONARD.....	Chairman
W. H. JOHNSTON	Director
GEO. A. CAMPBELL.....	Director
C. C. COTTRELL.....	State Highway Engineer
FLOYD O. BOOE.....	Auditor and Acting Secretary

STAFF

GEO. W. BORDEN.....	Assistant State Highway Engineer
L. V. CAMPBELL.....	Office Engineer
H. M. LOY.....	Bridge Engineer
A. A. HORWEGE.....	Division Engineer
C. C. BOYER.....	Division Engineer
H. F. HOLLEY.....	Chief Draftsman
T. J. COLLINS.....	Equipment Superintendent
J. G. JUNIPER.....	Right-of-Way Agent



Reinforced Concrete Arch Bridge over West Walker River, Lyon County (80-foot Clear Span)

REPORT OF THE DEPARTMENT OF HIGHWAYS

INTRODUCTORY

Conditions existing through the biennial period of 1917-1919, with which every one is familiar, were such as to prohibit the construction of highways, and, if no other reason were available, the attitude of the Government during that war period was such as to prohibit the doing of the work. During that period, however, considerable preparatory work was done, which was of inestimable value in undertaking the construction work of the second biennial period of this department.

At the close of that biennial period the war had terminated and it appeared as though conditions would rapidly return to normal. We, in common with all of the other state highway departments of the country, looked forward to the biennial period of 1919-1920 as one in which we could do a great amount of construction work without being hampered by the difficulties which had previously existed. We believed that we could purchase materials and equipment at favorable prices, and that the labor situation would be clarified, even to the point that we might be required to partly care for an army of unemployed.

While we are glad that such a chaotic condition did not exist, conditions were far from what had been anticipated, in that prices did not recede, nor was there an overabundance of labor—in fact, not enough labor has been obtainable to properly carry on our work. So acute was the material and equipment situation and labor conditions that to a very large extent our program has been gaged thereby, and we have been forced to seriously consider at different times the advisability of ceasing the attempt to do construction work at all.

Facing, on the one hand, the insistent demand for highway construction, and, on the other, high prices and difficulties of every nature, we have carefully weighed each project before proceeding. In some cases our opinion has been to delay the work until a more opportune time; in others it was such as to forbid our going ahead at all, and in still others where the difficulties were sufficiently well removed and the improvement so obviously justified we felt warranted in proceeding. The progress of work in other States, particularly those of the West, was watched with considerable interest, and compared with the progress of those States no apology need be made by this department for its accomplishments during this biennial period.

The department has caused to be completed in this biennial period 144.08 miles of road and 6 bridges. This should not be taken to represent the results of the activities of the department, for the reason that while this report is being written there are eight contracts under way involving the additional improvement of 39.55 miles of roadway and 2 bridges. Many things preparatory to an enlarged program have been done, such as the construction of the Lahontan plant, the securing of an equipment organization with equipment, and the removing of certain restrictions of the federal requirements which will in the future permit the more rapid prosecution of work.

The multiplicity of difficulties which have hampered us in our work of the past should not be present in the future. The recent lowering of

prices and the apparent better labor conditions foretell for us an era in which work can be carried on with more rapidity, in a more satisfactory manner, and at a considerably lower cost. When such a condition comes about, it will become apparent to the people of this State that it was well no more construction was completed or undertaken during this last period than has been the case.

This report has been written with the idea of presenting in a readable manner all of the activities of the department, and it is believed that in the various following chapters those matters of interest have been so presented that a comprehensive idea of the endeavors, difficulties, and results encountered and attained by this organization can be had by any one reading the report.

Full acknowledgment should be made of the high sense of loyalty, the perseverance, and the service of the various members of the highway organization, without whose full spirit of cooperation we would not have been able to proceed successfully. This organization was entirely built up during a period when to obtain men required for our different tasks was indeed difficult, and when every other department throughout the country was bidding for their services. Discouragements such as have attended the activities of this department always have a tendency to disrupt any organization, but ours has survived this period to the extent that we are facing the future confident of our ability to carry out any program.

Acknowledgment is also made to the Bureau of Public Roads, and especially to Mr. B. J. Finch, District Engineer at Ogden, for the many ways in which they have greatly assisted this department. There have been many controversies between the bureau and this department, but they have always been carried on in an amicable manner and disposed of in a way that has left a most excellent feeling between the two organizations.

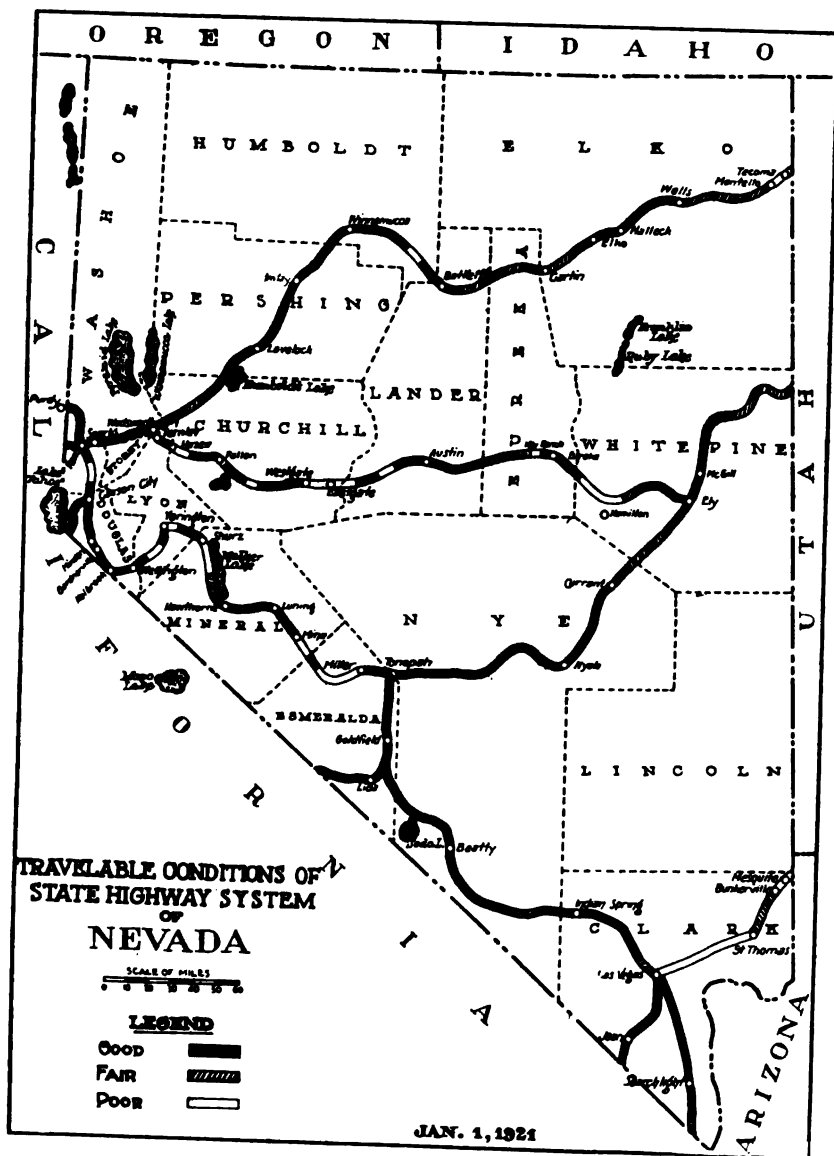
FEDERAL AID ROAD ACT

The original Federal Aid Road Act was passed by the Sixty-fourth Congress, and was signed by the President on January 11, 1916. It was amended by the Sixty-fifth Congress, and signed by the President on February 28, 1919.

Under the original Act there was made available to this State a total sum of money aggregating \$962,684.21 and under the amended Act of 1919 an additional sum of money totaling \$2,564,591.97, making available in all the total sum of \$3,527,276.18.

The purposes of federal participation in road work in the various States were, aside from the financial assistance given to the States: first, the encouragement of the creation of state highway departments and the performance of the work by some centralized authority; second, the improvement of some sort of a comprehensive road system, which would ultimately become the main trunk-line of travel and with which the roads of lesser importance would connect; and, third, the participation in an advisory capacity on the part of the Federal Government and the encouragement of a continuation of road work by the various States after federal aid had ended. Contrary to the belief of many, federal participation in state highway construction is not without some restrictions and many regulations.

Under the conditions of the original Federal Aid Road Act and as later amended, together with the regulations promulgated by the



Secretary of Agriculture, the requirements which must be met by a State to secure federal aid are as follows:

1. The Government will participate in road construction only through a duly organized and existing State Highway Department.

2. All administration expense must be borne by the State.

3. Federal aid will be granted only for those projects included within a definite and comprehensive highway system, which so far, in this State, consists of our State Highway System as laid out by legislative Acts, and the road in Washoe County from Reno to Purdy, near the California state-line.

4. It is specified that the Government will not participate in any improvement in an amount of money greater than 50% of the cost of construction and that the maximum allotment will be \$20,000 per mile, exclusive of bridges over 20-foot span.

5. Only projects substantial in character and proposed to be improved in accordance with approved plans and specifications will be considered. The State, on its own behalf, and without financial assistance from the Federal Government, is required to make all necessary surveys, plans, specifications, and estimates.

6. Rights of way shall be provided by or on behalf of the State and damages to adjoining property paid for by the State. The Government will not participate in this expense.

7. The method of making surveys, plans, specifications, and estimates, and the doing of the work itself, must be in accordance, generally speaking, with well-defined rules and regulations of the Federal Government, so that in a great many matters the State has no initiative.

8. Every item of the work, from the preliminary location to its final completion, including the awarding of contracts, the testing of materials, and every other matter, is under the direct supervision of the federal authorities.

9. The money which is made available by the various Acts of Congress is set aside for certain fiscal years which differ from calendar years in that they extend from the 1st of July to the succeeding 30th of June.

10. The allotments heretofore made are as shown in the following table, the fiscal year referred to therein being the calendar year in which the first part of the fiscal year is taken:

<i>Original Act</i>	
1917.....	\$64,398.30
1918.....	128,796.60
1919.....	193,229.82
1920.....	257,173.38
1921.....	319,086.11
Subtotal.....	\$962,684.21

<i>Amended Act</i>	
1919.....	\$642,933.46
1920.....	964,400.19
1921.....	957,258.32
Subtotal.....	2,564,591.97
Grand total.....	\$3,527,276.18

11. It is provided that, should the State fail to expend within three years any money allotted to it, that the allotment will be withdrawn and the money distributed to the various other States.

12. The State is required to first make the expenditure and then collect it from the Government. The Government participates in the cost of construction as it progresses, but does not pay its share for anything except completed work and materials actually in the roadbed.

13. The Government retains 5% of its share of the cost of each individual project until finally completed and accepted by it as satisfactory.

14. The State is required to forever maintain, in accordance with federal requirements and without financial assistance from the Federal Government, all of the projects which are constructed with federal aid funds.

To those unfamiliar with highway work as it must be carried on in cooperation with the Federal Government, the procedure necessary must seem cumbersome, full of unnecessary details and regulations; but as a matter of fact there is hardly any requirement of the Federal Government, in so far as the procedure is concerned, which could well be avoided and yet carry the work on in an intelligent and businesslike manner. It is true that the requirements impose upon us a heavy duty in the matter of the preparation of plans, the carrying on of the work, and the accounting.

The relations between this department and the bureau have always been amicable. There have been many matters of detail, particularly as to types of roadway, location, and widths of same upon which we could not agree with the opinion of the engineers of the bureau, but in most cases it has been comparatively easy to find an adjustment. Probably the most serious matter which has confronted this department during the biennial period just closing was in the matter of the widths of roadway, the bureau taking the attitude in the early part of the construction season of 1920 that they would not approve road projects of a width less than 24 feet, and to this we could not agree. The matter was taken up by Governor Boyle and Mr. James M. Leonard, Chairman of the Board of Directors of this department. Mr. Leonard's letter relative to this subject follows in full:

The Board of Directors of this department has been watching with alarm the great tendency on the part of your bureau to criticize the width roadway and surfacing proposed in our recent project statements.

This communication is addressed to you partly with the hope that it will explain the reason for our proposals, and partly to induce you to have those of your organization having to do with this criticism come out here and become thoroughly familiar with the conditions with which we are confronted.

No widths of roadway, or of surfacing, have been proposed until the matter has been given very careful thought and consideration by our organization, and in every case these have been approved by your District Engineer, Mr. Finch, in Ogden, a man who is acquainted with our conditions and one who knows our peculiar problems.

The relations between your bureau and our organization have been most amicable, and there is no desire on our part

except to continue our existence in that manner. None of us are actuated by any other motive than to give the public of this State the maximum benefit for the expenditure. Except in the immediate vicinity of our larger towns and cities, the existing roads are single-track desert trails, and for the most part made by the wheel-tracks of the vehicles traversing the territory, and taking the line of least resistance. Rank growths of sagebrush, greasewood, and mesquite mark the limits of this single-track roadway, so that, if one were to view our State from the air, he would distinguish our highways from the rest of the landscape by great strips of barrenness six or seven feet wide. These roads now serve our people passably well, and if a greater width were needed, the need would be recorded on the ground by the traffic itself. Our construction problems are of road surface, drainage, and grades, and not particularly of width. Probably 80% of our existing roads follow the undulations of the ground surface, and the very infrequent passing of vehicles is made without difficulty.

With the installation of drainage structures, however, and the grading made necessary to obtain satisfactory drainage and grades, thought must be given to the passing vehicles when they happen to meet, however infrequent that may be.

Project No. 32, involving the improvement of a section of our State Highway System in Humboldt County, proposed a width of roadway of 20 feet, the maximum which we felt our limited finances would permit, and the most which would really be of service to the traveling public. Exception to this width was taken by your office, and a width of 24 feet proposed; this notwithstanding the fact that the office of the District Engineer had approved the width, and that of the project connecting this one. Number 16 is a graded roadway with a width of 15 feet. It is obvious to us that, if this project were constructed for the full width of roadway suggested by your office, it would be a needless expenditure of money, for the reason that there cannot be, for a long time at least, any use for such a width of roadway, and immediately upon the road becoming used vegetation would grow on each side to such an extent that within a very short period of time there would be visible and usable only a portion of the 24 feet.

Federal Aid Project No. 2, Nye 4-A, is constructed of a roadway width of 15 feet and is now being used; immediately after it was open to traffic, we made an inspection of this project with our engineer, Mr. Cottrell, and came to the conclusion while there and on the ground that to have built the roadway of a greater width would have cost a considerable amount of money and that it was not warranted. Traffic on that project is considerably heavier than it will ever be on Project No. 32, by reason of its proximity to a larger town and it being the main artery of travel from a railroad terminus.

Exception was taken to the width of gravel surface for Nevada Federal Aid Project No. 19 by a letter from your

office to Mr. Finch, dated April 24, in which it was suggested that an additional 2 feet be added in width in order to make the surface 12 feet wide. This 2 feet was not proposed by your bureau in order to change the road from a single-track road to a double-track road, but merely for maintenance purposes. This extra 2-foot width at the contract price of 58 cents per square yard would cost very nearly \$700 per mile for surfacing alone—quite an item in desert-road construction. In the letter above referred to, the statement was made that your bureau is averse to placing a gravel surface of less than 12 feet in width.

All our roads in outlying districts which need be surfaced with gravel we desire to construct of a single-track width, namely 9 and 10 feet, depending upon local gravel conditions. Recent bids on surfacing have brought out the fact that, if we must do any of this work, it will have to be done at very high and exorbitant prices. The contract for Project No. 17 was for a 5-inch gravel surface at 55 cents per square yard; for Project No. 1, 43 cents per square yard, and for Project No. 19, 58 cents per square yard.

While we do not, as a general rule, believe in the policy of cutting down the quality of construction in order to cover more miles of territory, we do know that it is absolutely necessary for us to watch our finances very carefully and build nothing of higher quality than is absolutely necessary. It must always be remembered that with all our state and county tax money, our million-dollar-bond issue, and the bond issues of the various counties, we barely have enough money at this time to meet federal aid that has been made available to this State. Every project which we have must of necessity be a federal aid project and as much of our funds as possible used for the purpose of taking advantage of the federal aid appropriations. It will be difficult, indeed, for us to ask the next Legislature for more money for construction purposes, for the reason that it will be difficult to raise any more money than at present, so that we are confronted with a very difficult problem and made more difficult by reason of the fact that it must be solved during a period of exceptionally high prices. When the maintenance of these various projects requires a drain on our treasury, our problem will be still greater, and especially will this be so if we are required to maintain unimproved desert roads which have not been improved by reason of your requiring us to concentrate our funds on a higher quality of road than we deem necessary for our conditions.

I trust, while this letter may not of itself be a sufficient incentive for your bureau to change its attitude toward the width of the proposed roadways and surfacing, that it will cause you to have a representative from the Washington office come out here and become thoroughly acquainted with our peculiar construction problems and finances.

As a result of the efforts of Governor Boyle and the presentation of the matter by Mr. Leonard's letter, a conference was held in Reno on July 26, at which were present, aside from the members of this department, Dr. Hewes, General Inspector of the Federal Government for the western part of the United States, and Mr. Finch, District Engineer of the Federal Government, who has charge for the Government of the federal road-work in this State. A full and complete discussion took place as a result of which the bureau, through Dr. Hewes, made the statement that the previous attitude as expressed by the Government would be, in part at least, rescinded, and that for roads situated in the outlying districts of the State and in other localities, where the traffic requirements do not require it, the Government would approve projects having a width of roadway of 18 feet or more and a surface width of 10 feet or more. While this met the objections which we had raised, the changed expression came too late in the season to permit of the going ahead with construction work on a few of the projects in the outlying sections of the State.

While the requirements of the Government are very exacting in the matter of accounting, there have been no serious matters of objection on our part, and be it said to their credit that reimbursements to our State Highway Fund, on account of construction work accomplished, have been made within a very satisfactory time, considering the usual time required for such governmental activities.

The biennial period just closing has been one of constantly increasing prices; estimates made two or three years ago, and upon which federal aid was then granted, have had to be revised constantly. In the case of each revision application has been made to the bureau for a revised agreement and request made that the participation of the Federal Government be made on the basis of the revised estimate. In all except one or two of the revisions the Federal Government acceded to our desires, and have thus kept apace with the tendency for higher construction costs.

Notwithstanding the fact that, previous to the awarding of any contract, detailed plans are prepared, it is frequently found necessary to revise grade lines, change alinement, do extra work and additional work, all of which was not at first contemplated, and which has a tendency to increase the ultimate cost of the improvement; and whenever it has been found necessary to do any work of this character the matter has been taken up with the federal authorities and their approval obtained, so that in those features of our work where federal aid could legitimately be given we have been able to secure their cooperation and participation. A detailed estimate which accompanies each agreement between this department and the Federal Government contains an item providing for engineering and contingencies during the construction period; this amounts to 10% of the estimated cost of the project. By this means the Federal Government pays us one-half the cost of the engineering work made necessary during the construction period, such as the staking-out of the work and its inspection.

We have, in some cases, been able to hold our engineering costs within the limit of the 10% provision, and in other cases we have not. In most of those cases, where the engineering costs have exceeded that estimated, the fault has been due to the slowness with which the work has been carried on by the contractor.

The first procedure that is necessary on the part of the State to initiate a project is to submit to the Federal Government what is known as a "Project Statement," which is in reality a request for federal money and in which the statement is made that if the request is granted the State will proceed with the construction along the lines outlined by it in this project statement. To date there have been submitted to the Government thirty-seven statements involving construction work of a total estimated cost of \$3,778,769.16. All the statements submitted by this department have been approved by the Secretary of Agriculture.

After the statement has been approved, it is required that the plans and specifications and estimates be submitted for approval, and if they are found satisfactory the Federal Government and the Highway Department enter into a form of agreement by which the State obligates itself to proceed with the construction and secure its completion within a certain specified time limit. These agreements are called "Project Agreements" and are a direct contract obligation of the State. To date thirty such agreements have been entered into with the Federal Government, involving highway and bridge construction of a total estimated cost of \$2,658,602.43, on which the Federal Government has agreed to and has already partially paid the sum of \$1,250,283.89, the State and several counties being required to pay the balance.

The method of doing the work is outlined in considerable detail in these project agreements, and the State, in entering into such an agreement, obligates itself to the maintenance of the project for all time, and in conjunction with that it is provided that "the Highway Department will use every means within its power to insure proper and permanent maintenance of said project thereafter, and to that end will annually make an estimate of the amount necessary to properly maintain the said project and will recommend at appropriate intervals to the Legislature or other proper authority of such State that the sum so estimated be provided from time to time for such maintenance."

A part of the Federal Aid Road Act pertains to the construction of roads through, or adjacent to, the National Forests, and a separate appropriation is made for that particular purpose. This appropriation is allotted to the several States in a manner similar to the allotment of funds under the Federal Aid Road Act, and such allotments to the State of Nevada follow:

1917.....	\$19,100.00	1922.....	\$19,100.00
1918.....	19,100.00	1923.....	19,100.00
1919.....	19,100.00	1924.....	19,100.00
1920.....	19,100.00	1925.....	19,100.00
1921.....	19,100.00	1926.....	19,100.00
	<hr/>		<hr/>
	\$95,500.00		\$95,500.00
Making a total of.....		\$191,000.00	

The State Highway System as outlined crosses the National Forest in three different localities: first, east of Tonopah through the southern end of the Monitor Division of the Toiyabe Forest; second, through the Nevada National Forest in eastern Nye and Western White Pine Counties and through the northern part of the Toiyabe National Forest just east of Austin, in Lander County. The projects in the locations numbered above as 1 and 3 have been constructed as forest roads by the Federal Government in connection with aid extended by the State and counties.

The procedure necessary to be followed in the case of forest roads is almost directly opposite to that employed in connection with federal aid in that the Federal Government makes all surveys, plans, and specifications, and, in most cases, does the construction work itself, the State being required to pay at least one-half the cost of not only the construction work but of the surveys and preparation of plans. The maintenance of the project after it has been completed is required to be done by the State without assistance from the Government, except in extraordinary cases.

The money which is available to the State for use in constructing forest roads need not be confined to the State Highway System, but may be obtained by any county for road construction where the road meets the interpretation of the bureau as one which might be constructed as a forest road.

The multiplicity of the details required in connection with federal aid and forest-road projects necessitates quite an extensive administration and clerical organization, without which federal aid funds could not be obtained in order that the work itself be carried on.

MATERIAL, LABOR, AND HIGH PRICES

The biennial period just closing has been an exceptional one in the respect that there has been probably no similar era in the history of this country in which efficiency and cost of labor, the delivery of materials, and the securing of equipment have been so uncertain.

All these conditions have been reflected in no small degree in the cost of doing highway work all over the country and particularly in this State.

Unfortunately the actual building of roads commenced in this State with the inauguration of this uncertain biennial period, so that it is impossible for us to judge by comparison what are really high costs of construction and what are not. Reports from other sections of the country, however, where comparisons can be made between pre-war and post-war period, indicate that highway costs have practically doubled. One of the best comparisons is that worked up by the engineer of the County Highway Department of Cook County, Ill., which is the county in which the City of Chicago is situated. That comparison shows that a certain type of road, costing \$20,129 per mile in 1916 and \$22,523 per mile in 1917, under similar conditions cost \$41,421 per mile in 1920—an increase over the 1916 cost of 105.8%. The table from which this information is obtained appears on the opposite page.

From this table it is apparent that the great increase in the cost of materials which represent the major portion of that type of road construction was considerably more in this State than in Cook County, Ill., and that the increase in labor cost is about the same or slightly less.

Information obtained from the State Labor Commissioner shows that for over 20,000 employees in this State the average hours worked per day in 1919 is three-tenths of an hour less than in 1915 and that the daily wage is 78 cents more in 1919 than in 1915. The employees enumerated above include every one receiving salary or wages. It is a fact, however, that increases have been more pronounced and greater among those engaged in construction work, such as the building of highways, than among those occupying clerical positions. It is difficult.

however, to state what the actual increase in wages for highway construction has been, for the reason that no direct comparison can be made with pre-war conditions.

Not only was there a large increase in the cost of labor, but it is a fact that the efficiency, generally speaking, was considerably lowered, and this last caused more concern among contractors than the increase in wages. It is apparent to any one that, with the labor cost doubled and the efficiency lessened to the extent of 50%, the contractors or the department employing such labor were only receiving about one-quarter of the value as compared with conditions as they existed in 1915 or previous years. All during this biennial period except at its close there has been a dearth of labor, more pronounced in some parts of the State than in others. So acute was this condition in some sections that it was practically impossible to carry on highway construction at all. This was true particularly in Elko County, where

INCREASE IN PRICE OF CONCRETE ROAD CONSTRUCTION IN COOK COUNTY - Ill. Width - 18 Ft. Shoulders 6 Ft.						
	1916	1917	Per Cent Increase	1920	Per Cent Increase Over 1916	Per Cent Increase Over 1917
Total Cost of Road	\$5,886.00	\$8,911.59	11.9	\$15,156.05	105.8	84.0
Total Cost of Road Per Mile	20,129.00	22,523.00	11.9	41,421.00	105.8	84.0
Total Cost of Materials Per Mile	11,875.00	13,365.00	14.9	21,255.00	79.0	59.0
Total Cost of Labor Per Mile	8,254.00	9,158.00	10.95	20,166.00	144.5	120.0
Cost of Labor Per Hour	25	.40	60.0	1.00	300	150
Cost of Teams Per Hour	.60	.75	25.0	1.10	83.4	45.7
Cost of Cement Per BBL	1.46	1.76	20.5	2.03	39.0	15.4
Cost of Sand Per Cubic Yard	1.10	1.15	4.5	2.25	104.5	95.6
Cost of Gravel and Stone Per Cubic Yard	1.10	1.15	4.5	2.25	104.5	95.6
Cost of Steel Per Pound	.04	.045	12.5	.07	75.0	55.6
Cost of Lumber Per M	30.00	40.00	33.3	73.00	143.0	82.5
Cost of Freight Per Ton	.40	.40	0.0	.60	50.0	50.0

for the season of 1919 the contractor was unable to secure but a very small percentage of the men who were necessary to carry on his work.

For long periods of time the various labor agencies throughout the State were constantly besought by highway contractors for men whom they were unable to supply except to the extent of partial requests.

It was called to our attention at different times that the inauguration of new highway contracts in some sections of the State would so seriously hamper agricultural pursuits and local industries that it would be inadvisable to divert labor to highway construction, and when such conditions have been brought to our attention we have given the matter serious thought and have acceded to the demands of the local industries.

The lowered efficiency of labor, its higher price, and the difficulty to obtain it at all have been reflected to a full degree in the prices which

have been paid upon our work, and we have had in some manner or other to pay for all of this in an indirect way, and where it has been necessary for us to employ labor ourselves, such as on the construction of the plant at Lahontan and on our various maintenance operations, we have had to pay for all of it directly, and we can understand more fully the difficulties with which contractors have had to contend during this biennial period.

Not only has this condition cost the State a considerable amount of money, but it has also had a large tendency to cause delays in completion of the various projects, so that where it had been anticipated that a project would be completed on a certain date it would actually not be finished until several weeks and in some cases months later. The none-too-good labor condition has not been seen without some benefit, for the reason that it has forced every one who has to do with highway construction into the larger use of labor-saving machinery, which will continue long after those conditions become better.

Construction work of the kind handled by this department requires the use of a considerable amount of material other than the so-called road-building materials and the obtaining and use of a very large amount of road-building equipment and machinery. During this biennial period all of these have been very difficult, if not impossible, to obtain. The one item of barbed wire, which is used for fencing our rights of way, has been almost impossible to secure—in fact, at one time it was obtainable only after a wait of five to six months, and at the time this report is written an order has been standing for a period of about an equal length.

Equipment has been difficult to acquire by all of the contractors, and considerable delay has been caused by their not being able to secure what they wanted at the time of commencement of operations, or by the fact that they have had to take some substitute which did not fill all of the requirements the work demanded.

The Lahontan plant required the purchasing in the open market of a very large quantity of machinery, and its delayed completion was due to the poor market conditions existing at the time of its construction.

At the beginning of the working season of 1920, due to a very unfortunate contract which the department had awarded for the purchasing of crushed stone, we had no stock of sand or gravel available, and consequently were forced to construct a plant of our own and commence delivery from it at the same time paving operations were started. There were periods during the season when our ability to supply this class of material was not of the best, but, viewing the matter as a whole and considering conditions as they existed in other parts of the country, we are confident that the minimum of delays was encountered on this account.

We had fortunately entered into a very good contract for the furnishing of cement to us from California mills, and deliveries, we do not believe, were better in any other section of the country; this was due in great part to the fine cooperation given us by the Flanigan Warehouse Company of Reno.

On April 12 of the present year a new contract was awarded for 70,000 barrels of cement, to be delivered as required in 1920, and at the close of the season we were purchasing cement under this contract

cheaper than the United States Government, the State of California, or the counties in California doing considerable highway work. Certainly deliveries have been better to us, for an investigation during the middle of the season disclosed many contracts closed down in California for want of this very material. An unfortunate circumstance occurring during the middle of the season was the curtailment of power in California, which made necessary the lessening to a very large degree of the output of the various cement companies.

GOVERNMENT EQUIPMENT

At the meeting of the American Association of the State Highway Officials, held in Chicago in December, 1918, a request was made of Congress that through appropriate legislation provision be made to distribute to the various States such equipment and supplies, which the Government had purchased for war purposes and were no longer needed, as might be useful for road construction and maintenance.



Fifteen-foot Gravel Road in Pershing County. Project 19, Contract 26.

Section 7 of the Postoffice Appropriation Bill of the Sixty-fifth Congress reads as follows:

That the Secretary of War be, and he is hereby, authorized in his discretion to transfer to the Secretary of Agriculture all available war material, equipment, and supplies not needed for the purposes of the War Department, but suitable for use in the improvement of highways, and that the same be distributed among the highway departments of the several States to be used on roads constructed in whole or in part by federal aid, such distribution to be made upon a value basis of distribution the same as provided by the Federal Aid Road Act, approved July 11, 1916; *provided*, that the Secretary of Agriculture, at his discretion, may reserve from such distribution not to exceed 10 per centum of such material, equipment, and supplies for use in the construction of national forest roads or other roads constructed under his direct supervision.

While this authorization was anything but definite and not all that could be desired in other respects, we received a considerable quantity of equipment under its provisions.

A long time elapsed after the passing of the legislation before any equipment was actually distributed. It appeared necessary for the Secretary of War to determine first just what equipment might be made available for distribution, and just what might be needed for the purposes of the War Department.

The Motor Transport Corps had charge of the motor vehicles, and it was difficult for them to determine what they desired to keep for current work and possible future emergencies. The War Department had already commenced the sale of considerable equipment and supplies of all characters, and it seemed difficult to determine what should be sold, what should be retained, and what distributed to the States for road-building purposes.

This war equipment and material was to be distributed over the country, and considerable of it was in France.

On account of the ordinary time for governmental action and the extraordinary conditions surrounding this equipment and material, no distribution was made for a long period of time after the legislation was obtained.

During this period when it was impossible for us to secure equipment, it was likewise impossible to get any information of what might later be available to us. Altogether the commencement of the work of distribution was unsatisfactory to the several States.

Finally, however, certified lists were given to the Bureau of Public Roads and they, after deducting the equipment which they wished to retain, began the distribution to the various States.

Under this first Act the States were given the equipment free of any charge except that of its crating, loading, and freight. Compared with most States, this was obviously not fair to those States, such as our own, which were far removed from the various Army posts and supply centers where the equipment and material were located. A State situated like New York could secure a truck by merely driving it perhaps less than 100 miles, while we, in our isolated position, would be required to pay as much as \$500 for freight charges alone on each truck.

It was found during the first year of this distribution that, if the several States were to receive all of the equipment they desired, it would be necessary to secure the enactment of new legislation, and new legislation was also desirable to make the expense of this distribution equitable to the several States.

This objection culminated in the passing at the second session of the Sixty-sixth Congress of what was known as the Kahn Bill which, in so far as it pertains to the distribution of excess war material and equipment to the various States, is as follows:

A Bill to authorize the Secretary of War to transfer certain surplus motor-propelled vehicles and motor equipment and road-making material to various services and departments of the Government and for the use of the States.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That

the Secretary of War be, and he is hereby, authorized and directed to transfer such motor-propelled vehicles and motor equipment, including spare parts, pertaining to the military establishment as are or may hereafter be found to be surplus and no longer required for military purposes, to (a) the Department of Agriculture, for use in the improvement of highways and roads under the provisions of section 7 of the Act approved February 28, 1919, entitled "An Act making appropriations for the service of the Postoffice Department, for the fiscal year 1920, and for other purposes"; *provided, however, that no more motor-propelled vehicles, motor equipment, and other war material, equipment, and supplies, the transfer of which is authorized by this Act, shall be transferred to the Department of Agriculture for the purposes named in section 7 of said Act than said Department of Agriculture shall certify can be efficiently used for such purposes within a reasonable time after such transfer.* * * *

SEC. 2. That the Secretary of War is hereby authorized and directed to transfer to the Department of Agriculture under the provisions of section 7 of the Act approved February 28, 1919, entitled "An Act making appropriations for the service of the Postoffice Department for the fiscal year 1920, and for other purposes," for use in the improvement of highways and roads, as therein provided, the following war material, equipment, and supplies pertaining to the military establishment as are or may hereafter be found to be surplus and not required for military purposes, to wit: road rollers, graders, and oilers; sprinkling wagons, concrete mixers; derricks; pile-driver outfits complete; air- and steam-drill outfits; centrifugal and diaphragm pumps with power; rock crushers; clamshell and orange-peel buckets; road scarifiers; caterpillar and drag-line excavators; plows; cranes; trailers; rubber and steam hose; asphalt plants; steam shovels; dump wagons; hoisting engines; air-compressor outfits with power; boilers; drag, Fresno, and wheel scrapers; stump pullers; wheelbarrows; screening plants; wagon loaders; blasting machines; hoisting cable; air hose; corrugated-metal culverts; explosives and exploders; engineers' transits; levels, tapes, and similar supplies and equipment; drafting machines; planimeters; fabricated bridge materials; industrial railway equipment; conveyors, gravity and power; donkey engines; corrugated-metal roofing; steel and iron pipe, wagons, and similar equipment and supplies, such as are used directly for road-building purposes.

SEC. 4. That freight charges incurred in the transfer of the property provided for in this Act shall not be defrayed by the War Department, and if the War Department shall load any of said property for shipment the expense of said loading shall be reimbursed the War Department by the department to which the property is transferred by an adjustment of the appropriations of the two departments; *provided, however, that any State receiving any of said property for use in the improvement of public highways shall, as*

to the property it receives, pay to the Department of Agriculture the amount of 20 per centum of the estimated value of said property, as fixed by the Secretary of Agriculture or under his direction, against which sum the said State may set off all freight charges paid by it on the shipment of said property not to exceed, however, said 20 per centum.

SEC. 5. That the title to said vehicles and equipment shall be and remain vested in the State for use in the improvement of the public highways, and no such vehicles and equipment in serviceable condition shall be sold or the title to the same transferred to any individual, company, or corporation.

It is noted that this legislation directs the transfer of such equipment as will be no longer required for military purposes, that the freight charges and other expense incidental to the transfer are to be paid by the War Department. The States, however, are to reimburse the War Department to the extent of 20% of the estimated value of said equipment.

Under these two Acts of Congress we had received up to and including November 18, 1920, equipment and material of a value estimated to be \$766,527.05, at a total cost to the State of \$79,929.86, or approximately 10% of the estimated value.

A table giving the detailed list of the equipment and supplies which have so far been received, estimated value, cost to us, and disposition of same, follows this report.

Some of the equipment which we have received was not in the best of condition—in fact, in some cases it was considered little better than junk, worth, however, more than the transportation charges. In this matter we were more fortunate than most of the States, believing that, as a whole, the equipment which we have received was in a considerably better average condition. Be that as it may, we had no choice in the matter except to accept or reject that which had been allotted to us without the privilege of making an examination of it.

We have not received in all cases the equipment which we most desired; particularly is this true of that type of equipment most commonly used on road work, such as plows, road graders, road scrapers, etc. It is not believed that the War Department at the cessation of war had any great amount of equipment of this character on hand. It is certain, however, should a distribution be made of this character of equipment, that we will receive our proper share of it.

This equipment has been received by the State for three purposes: first, for road construction and maintenance to be done by state forces; second, for rental to contractors; and, third, for distribution to the various counties and municipalities for road and street work not under the jurisdiction of the Highway Department.

The various cities, towns, and counties are required to reimburse the Highway Department for the actual expense incurred in securing such material and equipment as has been distributed to them. In many cases to the initial expense we have had to add the actual cost of making small necessary repairs to the equipment. In any event the Highway Department has not received any profit.

Considerable thought has been given and much investigation made of the rental of this equipment to various contractors, and in our

determination of a method we have been guided very largely by the practice in other States. It is admitted that our method is not beyond criticism by the contractors, but at the same time it is thought to be the best one that can be worked out with the interests of the contractors and the State both in mind. The method we have adopted, and the one which is in use at the present time, is represented by the following rental contract form:

THIS AGREEMENT, Made and entered into this.....day of, 192...., between C. C. Cottrell, State Highway Engineer, acting by and for the Department of Highways of the State of Nevada, hereinafter referred to as Highway Department, and....., hereinafter referred to as the Contractor.

It is accordingly covenanted and agreed as follows: That for and in consideration of the sum herein named, and certain conditions to be fulfilled by the contractor, the Highway Department agrees to lease to the contractor, for use in constructing roads in the State of Nevada, certain motor trucks and other equipment which it may have available for said purpose.

The Highway Department will furnish all of said trucks and other equipment to the contractor in good condition at the nearest state storage house, and the contractor hereby agrees that any of said trucks or other equipment he may select is in good condition at the time of said acceptance by him; it being expressly understood that if the equipment was in other than good condition he, the contractor, would not have accepted it.

The Highway Department will be responsible for the license fee, and agrees to furnish all tires for trucks and to keep tires in repair while said vehicles are leased to the contractor.

The Highway Department reserves the right to recall any or all of the equipment leased here by the contractor by giving him five days notice.

The contractor agrees to employ only competent truck drivers, and assumes the entire responsibility for the use and care of the equipment while in his possession. The contractor further agrees that he will remove immediately any operator of said equipment upon request of a representative of the Highway Department.

It is agreed that, except for tires on motor trucks, the contractor will assume and hereby agrees to assume all the expense of operation and repairs of whatever nature, and that when the equipment is returned to the Highway Department it shall be returned in at least as good a condition as when received, reasonable wear and tear only excepted. The contractor agrees to make all repairs in a manner satisfactory to authorized representatives of the Highway Department.

The contractor agrees to operate trucks both as to load and speed within limits prescribed by the manufacturer or such other limits as may be specified in writing by the Highway Department.

The contractor agrees, in addition to the observance of all

the conditions herein set forth, to pay to the Highway Department rental as follows:

For each and every 2-2½ ton truck.....\$10.00 per day.

For each and every 3-3½ ton truck.....\$12.50 per day.

For each and every 4-4½ ton truck.....\$15.00 per day.

For each and every 5-6 ton truck.....\$17.00 per day.

It is agreed that the rental be for each and every day (Sundays and holidays included) for each and every piece of equipment from the day delivery is taken by the contractor at the state storage yard until it is returned to the same place, with the following exceptions:

First—Sundays and holidays when the equipment is not used.

Second—Periods when the weather, or other conditions over which the contractor has no control, prohibits the use of the equipment.

The contractor agrees that at the time of such nonuse of equipment and at no other time he will secure a written statement from the nearest representative of the Highway Department that such nonuse was necessitated by one of the above contingencies; otherwise the said contractor agrees to pay for each and every day the equipment is in his possession.

It is agreed that the Highway Department will, on the first day of each month or immediately thereafter, send an itemized statement to the contractor of the amount due said Highway Department on account of the rental of equipment during the preceding calendar month, and the contractor agrees within twenty (20) days thereafter to pay to the State Treasurer of the State of Nevada (by mailing to the State Highway Engineer, Carson City, Nevada) the full amount of said statement, and it is agreed that, should the contractor neglect or fail to pay for said rental as aforesaid, the Highway Department is given the right to deduct the same from any money that is then or might later be due said contractor.

It is mutually understood and agreed that the terms of this agreement are to be changed in no manner, except by written consent of the parties hereto, and that there is to be no other understanding of any nature whatever respecting the rental of equipment except as contained herein or in the manner provided for.

The matter of the rental charge itself is one to which much thought has been given, and in determining it consideration has been given to the cost of renting trucks and equipment from private individuals and firms, also to the cost to the State of keeping this equipment in first-class condition. In addition to the above two considerations, a rental which will net the State a profit over and above the keeping of the trucks in good repair is desirable in order to provide a sinking fund for the purchase of new equipment in future years, for it must be remembered that, no matter how well at present equipment is kept in repair, it is only a question of time, and in some cases a very short time at that, until it is entirely worn out or becomes obsolete in type.

Due to the fact that the matter of rental of equipment to contractors is new in this State, and because no expensive repairs have so far been

necessary on most of the equipment, complete information is not just now available as to how large a sinking fund can or should be provided with the rentals now in vogue.

It may be that, with experience over several months, it will be necessary for us to revise the charges for rental of equipment, both on account of our expense of repairs and upkeep and on account of the rate being too low to provide an adequate sinking fund. The various contractors engaged upon our work have been informed that we in no manner obligate ourselves to the rental of this equipment to them, but rather they have been advised that in case they desire the equipment and it is available we will be glad to let them have it.

The principal controversy which we have had in the rental of the equipment has been on account of repairs, and this is not a condition peculiar to our department, for we find that it is one with which every state highway department is confronted. On our own work of construction and maintenance the rental of the equipment is charged to the work just the same as though it were rented to a contractor.

For the purpose of housing the equipment and providing for its repair a plant has been constructed near Reno which we have designated as the "State Highway Maintenance Yard." Previous to the selection of this site finally adopted between Reno and Sparks a thorough investigation was made of different locations. It was first determined that, on account of railroad facilities which were of the utmost importance, the plant would have to be located on the railroad furnishing the best and cheapest transportation facilities, and it was also thought advisable to give consideration to the need of proximity to a large supply center in order that a minimum amount of delay might be had in the securing of small supplies and the doing of special work. It was not desired to get within the confines of any city or town, for the reason that we desired to be free of any ordinances or regulations that might hamper us in our construction or operations. The land selected finally was a portion of a tract owned by the State, it having been purchased for the use of the State Hospital for Mental Diseases. A satisfactory arrangement was made between this department and the board of the hospital whereby we were given a lease for the tract consisting of 3.65 acres.

Upon this tract there have been constructed a large machine-shop, office, and storage sheds. The ultimate idea is that the tract is to be completely surrounded in a quadrangular manner with sheds for the housing of the various pieces of equipment, and within this quadrangle to construct such shop buildings as may be found necessary. The buildings heretofore constructed, with the exception of the office, are of corrugated metal, a considerable quantity of which was received from the Federal Government with the other material and supplies distributed to us by them.

The machine-shop is supplied with electric power, the driving units being two electric motors. The equipment so far installed consists of two large forges, two anvils, a power hammer, a lathe, a bolt-threading machine, a power hacksaw, and other machine-shop equipment.

A necessary though very expensive adjunct to this plant is a water main connected with the Reno and Sparks water system. Ample provision for fire protection has been made which includes two fire

TABULATION OF EQUIPMENT RECEIVED FROM WAR DEPARTMENT

Quantity	Item and make	Size	Condition	Total market value	Cost to state	Disposal
10	Trucks—Peerless	3 ton	Excellent	\$30,000.00	\$5,370.60	Distributed to counties
2	Trucks—International	3 ton	Excellent	4,000.00	1,074.12	Distributed to counties
11	Trucks—Moreland	2 1/2 ton	Fair	8,250.00	1,116.10	10 to counties, 1 in stock
66	Trucks—Moreland	3 ton	Good	20,000.00	1,817.50	1 to county, 1 in stock
14	Trucks—Nash Quad	3 ton	Good	204,500.00	21,314.40	43 in stock, 22 to counties, dismantled
4	Trucks—Heavy Aviation	3 ton	Excellent	50,000.00	4,248.18	Distributed to counties
23	Trucks—Kelly Springfield	3 1/2 ton	Excellent	86,000.00	8,150.75	Distributed to counties
14	Trucks—Kelly Springfield	2 1/2 ton	Excellent	41,000.00	4,545.75	8 in stock, 15 to counties
12	Trucks—Packard	2 1/2 ton	Fair	14,000.00	3,089.49	11 in stock, 3 to counties
42	Trucks—Packard	3 ton	Excellent	72,000.00	3,971.20	11 in stock, 3 to counties
2	Trucks—F. W. D.	2 ton	Excellent	168,000.00	11,710.86	In stock
	Trucks—G. M. C.	2 ton	Excellent	4,000.00	1,517.50	In stock
215	Totals all makes		Good	\$682,650.00	\$63,226.49	128 in stock, 98 to counties, 1 dismantled
1	Automobile—Haynes 6	5 pass.	Fair	\$500.00	\$98.75	In stock
5	Automobiles—Studebaker	5 pass.	Poor	500.00	483.70	1 in stock, 4 discarded
13	Automobiles—Ford	5 pass.	Fair	1,950.00	1,257.72	11 in stock, 2 discarded
7	Automobiles—Ford	Ambulance	Good	1,750.00	1,578.50	5 in stock, 2 discarded
26	Totals all makes		Fair	\$4,750.00	\$3,416.67	18 in stock, 8 discarded
1	Tractor—International	30 H. P.	Excellent	\$1,500.00	\$399.73	In stock
1	Tractor—Cleveland	20 H. P.	Excellent	1,500.00	399.73	In stock
2	Tractors—Holt	7 1/2 H. P.	Excellent	12,000.00	799.47	In stock
1	Road roller—Austin	10 ton	Excellent	3,000.00	620.38	In stock
5	Totals of tractors and rollers			\$18,000.00	\$2,219.32	
5 cars	Parts for Nash Quad	2 ton	Excellent	\$13,500.00	\$870.92	In stock, except few to counties
25 boxes	Parts for Heavy Aviation	3 ton	Excellent	2,500.00	31.13	In stock, except few to counties
1 box	Parts for Kelly Springfield	3 ton	Excellent	800.00	21.19	In stock, except few to counties
1 unit	Parts for Peerless	3 ton	Excellent	7,500.00	985.54	In stock, except few to counties
2 units	Parts for Packard	2 1/2 ton	Excellent	8,500.00	*850.00	In stock, except few to counties
1 unit	Parts for Moreland	2 1/2 ton	Excellent	1,000.00	*150.00	In stock, except few to counties
1 unit	Parts for Studbaker cars	2 1/2 ton	Excellent	2,500.00	*600.00	In stock, except few to counties
53	Parts for Studbaker cars	2 1/2 ton	Excellent	1,324.00	*36.00	In stock, except few to counties
26 boxes	Parts for Holt Caterpillar	7 1/2 H. P.	Excellent	2,500.00	*321.00	In stock, except few to counties
4 sets	Skid chains—Stanley hook	40 H. P.	Excellent	80.00	27.13	In stock, except few to counties
2018	Tires, solid—Assorted	1 1/2 x 6	Excellent	7,000.00	*221.04	In stock, except few to counties
325	Portable forges—Buffalo	Small	Excellent	1,000.00	620.74	In stock, except few to counties
382	Portable forges—Buffalo	Small	Excellent	1,124.00	76.00	In stock, except few to counties
2	Hand	Hand	Excellent	833.00	18.68	In stock, except few to counties
10	Tanks, steel	400 gal.	Excellent	100.00		In stock, except few to counties
	Tanks, steel	160 gal.	Excellent	250.00	*180.88	In stock, except few to counties

13	Water carts, 2 wheel.	160 gal.	Excellent.	975.00	100.25	In stock, except few to counties
1	Pump and engine—Barnes—Novo	6 H. P.	Excellent	150.00		
29	Pumps, piston—Double action.	Hand	Excellent	280.00		
5	Pumps, piston—Typhoon	4x5 inches	Excellent	2,500.00		
2	Pumps, piston—Hills	4x5 inches	Excellent	2,000.00	749.90	In stock, except few to counties
4	Pumps, piston—Trench	4x5 inches	Excellent	4,000.00		
1	Centrifugal pump—Wimbley	6 in. disc	Excellent	2,000.00		
235 sets	Harness—Cable trace	Double	Excellent	18,000.00	906.88	29 sets to counties, 206 sets in stock
12	Push carts—Concrete	1 cu. yd.	Good	180.00	61.34	In stock
6	Wheelbarrows, wood frame	3 cu. ft.	Good	21.00	*84	In stock
1	Jacks, hydraulic	1 ton	Excellent	75.00	*5.00	In stock
16	Winches, hand	3 ton, 24 in. Hft.	Excellent	400.00	*50.00	In stock
66	Escort wagons—Army special	4 up	Excellent	500.00	92.80	In stock
8	Wagon covers—Army special	6 d.	Excellent	9,900.00	2,112.00	In stock
5	Auto bodies—Ford delivery	12 inch	Excellent	96.00	*13.00	In stock
600 lbs.	Nails, finishing	6 d.	Excellent	175.00	115.75	In stock
441 coils	Barb wire, black iron	No. 12	Excellent	39.00	16.20	In stock
8000 ft.	Manila rope	1 inch	Good	882.00	610.00	3 reels to Chur. 2-B, 488 in stock
610 ft.	Manila rope	1 1/2 inch	Good	750.00		
2400 ft.	Manila rope	1 1/2 inch	Good	76.25		
14640 lbs.	Metal roofing, corrugated	1,756 sq.	Good	240.00	*50.00	In stock
2	Tables, folding	Small	Excellent	10.00	991.00	Material Plant Building
1	Planimeter—Coradi	18 inch	Excellent	50.00	1.00	In stock
17	Compasses—Gurley & Dietzen pocket.	5 inch	Excellent	68.00	*1.00	In stock
4	Dumpy levels—Young & Sons	5 inch	Excellent	560.00	*5.00	In stock
1	Transit—Beckmann	5 inch	Excellent	250.00	*15.00	In stock
1	Steel shelters—Elephant type		Excellent	200.00	*8.00	In stock
4	Unappropriated costs in handling equipment.		Excellent		*75.00	In stock
	Subtotals			\$91,127.05	\$11,087.38	
	Grand totals			\$766,527.05	\$79,929.86	

*Bills not received; probable cost to State estimated. Total cost is 10.43 per cent of value.

hydrants and other small hose connections with all necessary hose. The fire-protection system installed is interchangeable with that of the fire department of the city of Reno.

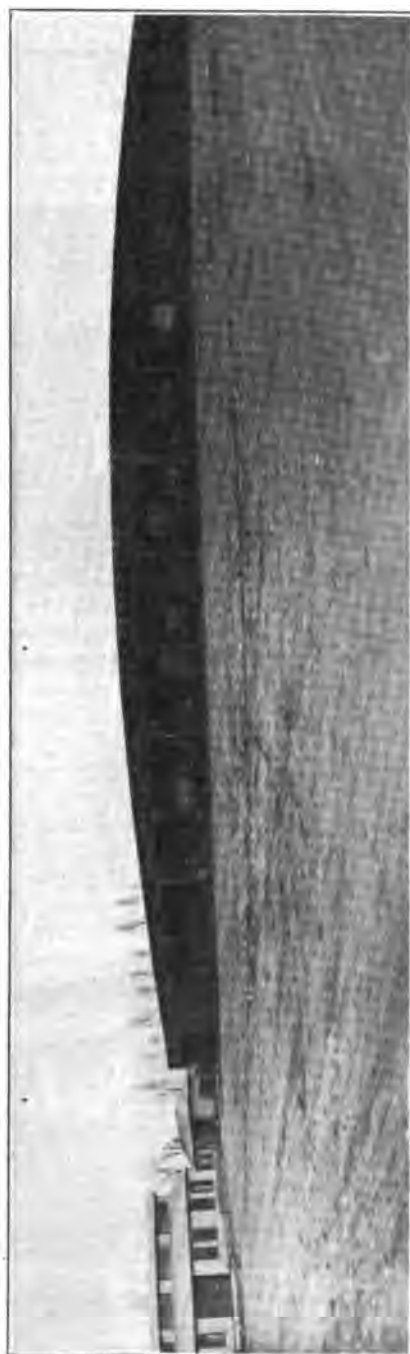
The investment so far made at the Reno Maintenance Yard for buildings and equipment amounts to \$37,194.09. While a definite plan has been worked out for the ultimate construction, the actual work is being made to progress no faster than our needs require. At this plant practically all of the repair work on equipment will be done, as well as all of the rebuilding and building of other equipment. We are fitted in such a manner as to build a great amount of the equipment which we will need in connection with our road construction in the future. So far but little of this work has been done; however, two large auto sprinkling outfits have been made, as well as considerable equipment and supplies of a minor nature.

The trucks which were received from the Government consisted of merely the chassis or else were fitted with bodies not adapted to our work, so that we have purchased, not only for ourselves, but for the various counties, cities, and towns to whom we gave some of this equipment, a large quantity of automatic dump bodies with power hoists. All of those intended for our own use were fitted to the trucks at our maintenance yard and a great many of those contemplated for counties were also fitted there, we charging the county for only the expense of doing the work.

Some of the trucks which we received were fitted with what is known as ammunition bodies, being a substantial steel body of about twice the depth required for our work. Some of the States have reconstructed these type of bodies so as to make them into dump bodies, and such an experiment was made by us; we have reconstructed two of them in this same manner and intend, during the coming winter months, when there is no great need for repair work, to do more of this reconstruction work.

Although the distribution of the excess war material and equipment by the Federal Government has been a great boon to the various States, and particularly to our own, for the reason that, had we not been able to receive this equipment, it would have been necessary for us to purchase, at a very great expense and in an unsatisfactory market, a great amount of the very equipment which we received from the Government. The distribution of this equipment has not ended by any means, and before it is ultimately completed we will receive a very large consignment of other material, some of which may be readily adapted to our work and some of which will undoubtedly require a great amount of reconstruction.

The counties, cities, and towns have been fairly well supplied with trucks; as a matter of fact, we are in a position now, should they so desire, to give to them the full amount of equipment of this character which they may require for their work. Some other equipment which they desire, and about which we have received many inquiries, has not been received, and it is doubtful whether some of it will ever be received by this State. However, at the present time a considerable quantity of equipment other than motor trucks is available to the counties, and such as is available may be had by the various counties by a mere request and the reimbursement of this department for the actual expense incurred in obtaining it from the Government.



View Showing Portion of Machine-Shop Building, Storage Shed No. 1, and the Office and Stock-room Building at the Reno Equipment Plant of the State Highway Department.



F. W. D. Truck received from the Government. This truck was camouflaged ready for shipment to France. Forty-two of this make of truck, all absolutely new, were received by the Department. It is typical of the entire 260 trucks received from the Government.



View of Machine-Shop and Office Buildings, Reno Equipment Plant.

SURVEYS AND PLANS

Much has been said and written in the last decade relative to the advisability of the detailed study given to the location and designs of our highway systems. In spite of arguments sometimes advanced by the layman, it has been shown in practice beyond the question of a doubt that the cost of this preliminary study is the best possible investment, in that it makes for (1) a comprehensive system of highways, (2) the most economical construction costs, (3) the best alinement, grades, and drainage conditions, and (4) a preknown construction estimate without which no system of financing proposed future construction can be worked out. It is also a requirement of the Federal Aid Road Act that, before the Government will advance moneys to the States for aid in highway construction, detailed surveys shall be made, and complete plans, specifications, and estimates prepared.

The task of locating our State Highway System may be divided into three distinct classes:

- (1) The selection, in a general way, of the various routes. To the extent that certain centers of population and outstanding topographical features were mentioned as points through which the state highways should pass, this selection was made, and a description of the various routes was given in the State Highway Act;
- (2) The reconnaissance survey, by means of which the general location of the highway between two fixed points is determined; and
- (3) The location survey, by means of which the details of alinement and grade between points located on the reconnaissance survey are worked out.

The description of Route 3, as defined in the State Highway Act, is typical of the selection of routes made by the language of the Act. To quote the Act, Route 3 is defined as "commencing at the city of Reno, thence running southerly through the city of Carson City; thence westerly to Glenbrook on Lake Tahoe; thence in a southerly direction to the Nevada-California state-line at or near Lakeside; beginning again at Carson City, thence to the town of Yerington by the most available and practicable route; thence to the northerly end of Walker Lake by the most available and practicable route; thence along the west side of Walker Lake to the town of Hawthorne; thence to and through the towns of Luning, Mina, and Millers to the town of Tonopah; thence southerly to the town of Goldfield; thence westerly by the most practicable and available route to the Nevada-California state-line." It will be seen that the highway route as described above must run from Carson City to Yerington by "the most available and practicable route." There are many factors entering into the final determination of the most available and practicable route, some of the most important of which are the economic values of the various possible routes from the standpoint of the number of people served, the present valuation of the country traversed, and the possibilities of future development; the distances between the two control points; the maximum grades; and the elevations of summits as determining whether or not the road will be blocked with snow during the winter months. These and many other factors are given serious consideration and weight by the Board of Directors and the State Highway Engineer in the study of the various possible routes, and a decision is

reached only after a complete investigation embracing every side of the question has been made.

When a decision is made as to the most available and practicable route between two fixed points as described in the Highway Act, the reconnaissance survey is begun. The reconnaissance survey consists, a general examination of the country through which the proposed road is to run, to the end that its main topographical features may be located in reference to the proposed location of the road. The selection of a route may be a simple or a very difficult proceeding, depending upon the topography of the country traversed and particularly upon the location of rivers and summits. If the line follows a river, the problem is comparatively simple, in that there is then to decide merely which river bank to follow. This is usually readily decided by weighing the probable costs, but other considerations, such as snow conditions, property values, etc., must be given due weight. When it is not possible to follow a river, the difficulties in selecting a line are increased, particularly so if the watercourses are found to run nearly at right angles to the general direction of the road. The reconnaissance engineer must then investigate all possible passes and summits, and select the best stream crossings. He must investigate soil and drainage conditions, the availability of rock, sand, water, and other road-building materials, the ruling grade to be adopted, and the sharpest curve to be used. He determines upon the best way to negotiate difficult topographical features and the best location for the highway to overcome snow difficulties. He must bear in mind the probable maintenance cost, and give weight to this question in his recommendations. When his investigations are complete, he has generally selected two or more possible lines, all of which follow, in a general way, the main adopted route. Preliminary estimates, based upon experience in constructing similar roads through similar country, are prepared, and these estimates, together with the topographical and other data submitted, are carefully weighed in the final selection of the line to be adopted. Generally speaking, the selection of a specific line can be made on a basis of the reconnaissance engineer's report and a field study of the proposed lines. It is sometimes necessary, however, on account of the equal desirability and cost of two or more lines, to stake out each of them, and the final determination cannot then be made until the lines are finally located and complete plans and estimates prepared.

When a line has been selected, a location party, consisting of a locating engineer and four or more assistants, is sent into the field and the location details are worked out. The reconnaissance engineer has previously determined the main topographical features through which the located line must pass, and it remains for the locating engineer to connect these predetermined "control points" with the best possible line. He studies the local soil, foundation, and drainage conditions in great detail, and often swings his line out of the most direct route in order to take advantage of better ground. The data compiled by the locating engineer are the basis for the preparation of plans and estimates, the acquiring of rights of way, and the awarding of the contract for constructing the road. It is possible for the locating engineer to effect an ultimate saving of sometimes thousands of dollars per mile by running two or more lines through difficult country, and it is therefore obviously well worth the cost and effort necessary to do this work. His

location notes must contain detailed alinement data, profile, and cross-sections, which give the elevations, not only of all points on the center line, but of each side of the line as well; the names of property owners, and distances and angles to their property corners; drainage notes, and recommendations as to the various sizes of bridges and culverts required; soil and foundation conditions, the composition of the sub-soil, whether earth, sand, loose rock, or solid rock, and the percentages of each; the location and size of local sand, gravel, and rock deposits and their availability for construction purposes; the location of natural and artificial topography, such as railroads, telephone lines, houses, fences, etc., and, in fact, all data necessary for the preparation of a detailed map of the country traversed, and an accurate estimate of cost. In spite of the great amount of information required from our locating parties, we have been able to keep the cost of our completed located line down to \$138.20 per mile, which compares very favorably with the cost per mile in every other State in the Union, and is certainly justified when the advantages of a properly located highway, and the ultimate saving in construction costs effected thereby, are considered. We have located to date 756.65 miles of line, or 39.82% of the total mileage of our State Highway System. The map on page 34 will show the extent of reconnaissance and location surveys made to date.

In the preparation of plans, specifications, and estimates, we conform to the requirements of the most modern practice, and are guided in our efforts by certain standards established by the Bureau of Public Roads. The present form and arrangements of our plans is the result of the study of a set of plans furnished this department by every state highway department in the United States. We have attempted to embody into our plans the best features of each of the sets submitted, and to eliminate the bad features. Everything that can be standardized is printed on the layout sheets, thus eliminating slow and costly repetition of work. From the notes submitted by the location party, the alinement map, the profiles, and cross-sections are worked up, and an estimate is computed. In order that this estimate may be the best economical possible, a great deal of care is necessary. In side-hill work the material taken from the cuts must just equal that required to make the fills, and to this end considerable refinement must be used in establishing the elevation of the finished roadway above or below the ground surface. A great deal of money can be wasted by not giving this point sufficient study. In rough mountainous country it is often possible to save money by shifting the center line one way or another to lessen the work. These matters must all be investigated to insure an economical design. The completed plans must be in sufficient detail to enable the contractors to work up an intelligent bid for the work to be done, and must serve as a guide to our engineers during the construction period. Deeds must be written and deed maps drawn up for each piece of right of way to be acquired. This feature is a costly one, but it is a requirement of the Federal Government that the State furnish the rights of way at its own expense. We have to date prepared plans and estimates covering 377.75 miles of highway, at a cost of \$54.03 per mile. This cost is low, considering the character of the country traversed and the value of the designs, and compares favorably with the mile-cost of other state highway departments.

TABLE SHOWING COST PER MILE OF

County	Route	Section	From	To	Miles final location as shown in 1918 report	Miles final location surveyed 1919-1920	Total miles located line	Miles plain (cont. piece 1917 1918)
Washoe	1	A	State Line	Reno		9.95	9.95	
Washoe	1	B	Reno	Vista Station		3.95	3.95	
Perishing	1	B	Toulon	Lovelock		3.92	3.92	
Perishing†	1	C	Lovelock	Zola	18.35		16.70	16.88
Perishing*	1	D	Zola	Mill City		27.81	27.81	
Humboldt	1	C	Golconda	Stone House		12.08	12.08	
Humboldt	1	D	Stone House	East County Line		10.86	10.86	
Lander*	1	A	West County Line	East County Line	45.40		28.45	5.00
Eureka*	1	A	West County Line	East County Line	22.10	6.99	27.25	
Elko*	1	A	West County Line	Elko	31.00		29.05	18.73
Elko*	1	B-1	Elko	Halleck		20.55	20.55	
Churchill	2	A-1	Hasen	Leeteville		8.29	8.29	
Churchill	2	B	Leeteville	Fallon	8.12		7.62	7.62
Churchill	2	C	Grimes Ranch	Sand Springs		17.08	17.08	
Churchill	2	D	Sand Springs	West Gate		11.69	11.69	
Churchill	2	E-1	West Gate	East Gate		11.50	11.50	
Eureka	2	B	Hay Ranch	Eureka		12.17	12.17	
White Pine	2	B-1	Pancake Summit	Little Antelope Summ.		12.50	12.50	
White Pine	2	B-2	Little Antelope Sm.	Illipah		10.42	10.42	
White Pine	2	C	Illipah	Keystone	13.88		27.46	12.46
White Pine	2	C-3	Keystone	Ely		5.88	5.88	
White Pine	2	D	Ely	McGill		12.69	12.69	
White Pine	2	E	McGill	Indian Creek		17.65	17.65	
White Pine	2	F	Indian Creek	Schellbourne		9.49	9.49	
Esmeralda	3	C	Goldfield	Tonopah	23.20		23.20	8.93
Mineral	3	D	Hawthorne	Cottonwood Creek		12.99	12.99	
Mineral*	3	E	Cottonwood Creek	Schurz	10.70		9.33	
Lyon	3	B	Yerington	Wilson's Station		12.56	12.56	
Lyon	3	C	Wilson's	Hudson-Aurora Road	6.89	0.04	6.93	6.89
Lyon	3	D	Hudson-Aurora Rd.	Douglas County line		4.69	4.69	
Douglas	3	A-1	Lyon County line	Walker River bridge		4.72	4.72	
Douglas*	3	B-1	Mountain House	Carter's Station	7.10		7.01	4.00
Douglas	3	B-2	Carters	Gardnerville		11.48	11.48	
Douglas	3	B-3	Gardnerville	Minden	1.76		1.80	
Douglas	3	C-1	Minden	3 1/4 miles north	1.80	1.65	3.45	1.80
Douglas	3	C-2	3 1/4 miles N. Minden	North County Line		8.15	8.15	
Ormsby	3	A	Douglas Co. Line	Carson City		3.12	3.12	
Ormsby	3	C	Carson City	Lakeview	0.72	2.76	3.48	0.37
Washoe	3	A	Lakeview Summit	Huffakers	19.80		19.79	9.32
Washoe	3	B	Huffakers	Reno	5.30	0.13	5.42	4.00
Nye*	4	A-1	Tonopah	Toiyabe Natl. Forest	17.72		14.75	14.75
Nye	4	D	Nyala	Forest bdy., Currant		39.00	39.00	
Clark and Nye	5		Las Vegas	Beatty		118.00	118.00	
Clark	6	D	Las Vegas	Half-way, St. Thomas		13.31	13.31	
Clark	6	E	Half-way point	St. Thomas		40.51	40.51	
Clark†	6	F	St. Thomas	Bunkerville		16.51	16.51	
Clark‡	6	G	Bunkerville	Utah State Line		6.19	6.19	
Washoe			Reno	Purdy		15.29	15.29	
Totals					242.08	551.90	766.65	110.75

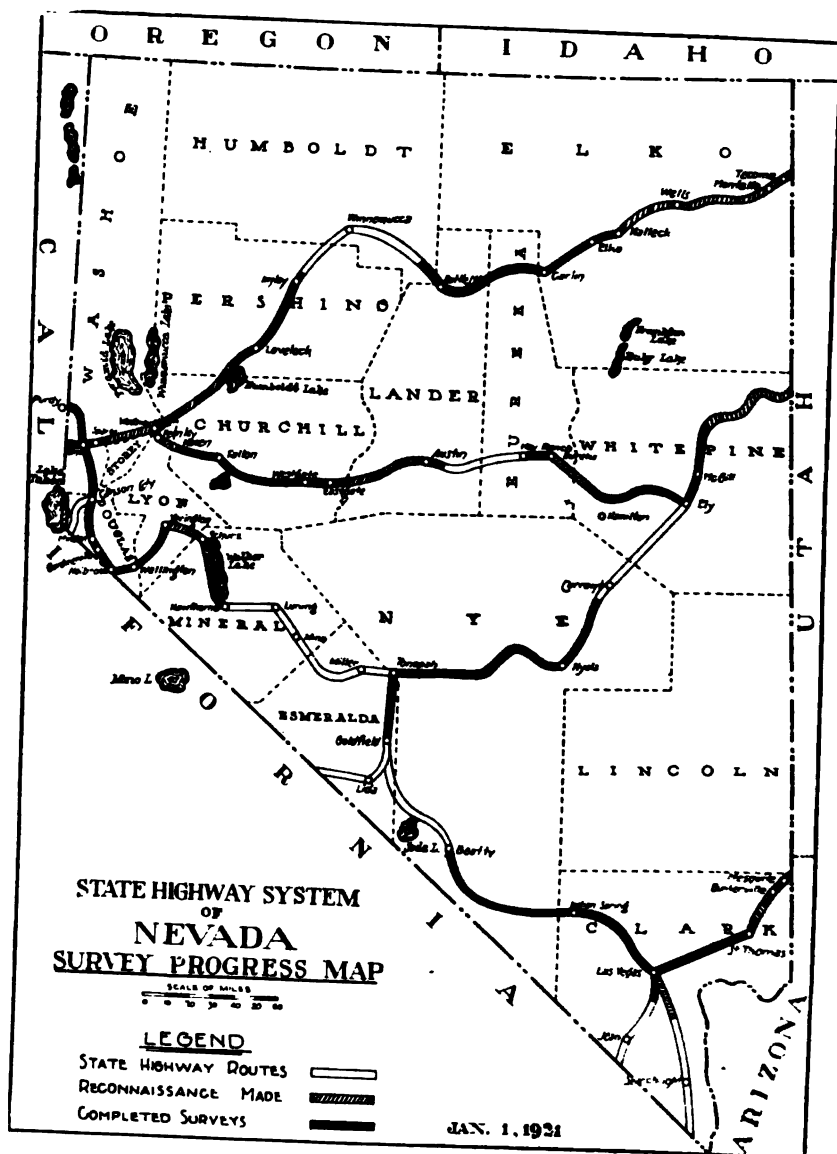
*Reduction on amount previously reported too high.

†Includes line in city of Elko.

‡Includes cost of bridge plans of special design.

SURVEYS AND PLANS, 1917 TO 1920, INCLUSIVE

Miles plans complete 1919-1920.....	Total miles plans complete.....	Cost of surveys 1917-1918.....	Cost of surveys 1919-1920.....	Total cost of surveys.....	Cost per mile of surveys.....	Cost of plans and estimates 1917-1918.....	Cost of plans and estimates 1919-1920.....	Total cost plans and estimates.....	Cost per mile plans and estimates.....
0.97	0.97		\$3,132.16	\$3,132.16	\$314.79		\$5.62	\$5.62	
			421.03	421.03	106.32		148.17	148.17	\$152.75
			50.16	50.16	12.80		7.26	7.26	
	16.70	\$1,506.27	417.92	1,923.19	115.16	\$602.81	258.83	861.64	51.60
27.81	27.81		2,483.09	2,483.09	89.29		1,463.71	1,463.71	52.63
			1,504.93	1,504.93	124.58		21.08	21.08	
8.00	8.00		1,199.64	1,199.64	110.59		20.35	20.35	6.78
3.52	8.52	2,579.75	72.01	2,651.76	93.21	153.41	249.49	402.90	47.29
6.31	6.31	2,754.34	3,062.45	5,896.79	214.19		678.24	678.24	107.49
8.34	27.07	3,209.13	547.65	3,756.78	129.32	627.60	549.26	1,176.86	43.47
19.83	19.83		2,981.52	2,981.52	145.02		544.32	544.32	27.45
8.29	8.29		1,493.36	1,493.36	130.07		470.97	470.97	56.79
	7.62	840.30	309.87	1,150.17	150.94	592.00	104.00	696.00	91.34
10.42	10.42		1,587.07	1,587.07	93.19		289.96	289.96	27.83
			1,637.92	1,637.92	140.11		20.65	20.65	
			1,653.17	1,653.17	143.70		7.02	7.02	
12.17	12.17		903.04	903.04	74.20		681.22	681.22	55.96
			1,442.90	1,442.90	115.43		9.01	9.01	
			1,442.91	1,442.91	138.48		37.42	37.42	
	12.46	2,899.28	4,191.90	4,191.90	152.65	385.86	136.04	521.90	41.89
2.00	2.00		1,217.99	1,217.99	207.14		237.16	237.16	118.58
			1,984.39	1,984.39	156.37				
			835.96	835.96	47.36				
			650.17	650.17	68.51				
1.73	1.73		1,013.57	1,013.57	78.03		91.94	91.94	53.14
9.33	9.33	2,907.97	7,323.90	10,236.87	1097.20		1,468.80	1,468.80	157.43
	8.98	1,142.67	56.65	1,199.32	51.69	266.40	241.88	508.28	56.92
12.56	12.56		2,137.29	2,137.29	170.17		725.34	725.34	57.75
0.04	6.98	2,672.90	544.64	3,217.64	464.29	1,225.30	391.64	1,616.94	233.32
2.31	2.31		1,038.43	1,038.43	221.41		379.01	379.01	164.07
			1,327.77	1,327.77	281.31				
	4.00	869.10	97.18	956.28	135.42	235.33	123.41	358.74	89.69
2.00	2.00		706.14	706.14	61.51		179.77	179.77	89.88
1.80	1.80		584.80	584.80	324.89		356.12	356.12	197.84
1.65	3.45	105.24	581.31	686.55	199.00	47.35	180.38	227.73	66.01
			1,272.29	1,272.29	155.11		121.73	121.73	
			216.94	216.94	69.53				
3.11	3.48	318.09	568.77	886.86	254.84	36.29	362.20	398.49	114.51
10.47	19.79	4,711.39	3,343.30	8,054.69	407.01	747.73	1,634.49	2,582.22	130.48
1.42	5.42	615.59	367.36	982.95	181.36	296.91	316.80	613.21	113.14
	14.75	1,184.62	5.20	1,189.82	80.67	254.17	136.82	390.99	26.51
4.50	4.50		4,064.88	4,064.88	104.28		178.02	178.02	39.56
85.00	85.00		1,186.35	1,186.35	10.05		50.16	50.16	0.59
			813.52	813.52	61.12		5.00	5.00	
13.31	13.31		8,296.75	8,296.75	204.81		200.71	200.71	15.06
			4,376.53	4,376.53	265.08		16.21	16.21	
			2,228.06	2,228.06	359.94		466.32	466.32	
15.29	15.29		1,765.40	1,765.40	115.46		1,173.26	1,173.26	76.73
267.18	377.75	\$23,275.64	\$76,296.96	\$104,571.60	\$188.20	\$5,471.16	\$14,939.29	\$20,410.45	\$54.03



BRIDGES AND DRAINAGE STRUCTURES

There is an axiom of road construction that "A road is no better than its foundation." To sustain the weights of the surface and traffic and keep the surface from disintegrating under the pounding of traffic, the foundation must be firm and unyielding, which means that it must be properly drained. For this reason, all projects are receiving careful consideration at the time that surveys are made, in order that the road will be located on such material and in such a way that it can be readily drained. A careful study of the entire project is made prior to preparing plans, so that bridges and culverts of sufficient capacity and proper location will be provided. Borrow ditches, when necessary, are constructed on such a grade that water collecting therein will be carried to a watercourse and thence away from the road.

A large portion of the area of our State is subject to "waterspouts," and we have had the problem of constructing permanent crossings over channels which normally carry little or no water, and yet, once in four or five years, carry a large volume which brings with it large quantities of gravel, sand, dirt, sagebrush, and in some cases large boulders. It is obvious that to provide a bridge for this large volume of water would entail considerable expense, and, as channels of this nature are frequently encountered, it was apparent that some other type of structure must be found. Small culverts capable of carrying the normal run-off would become clogged with débris during a cloudburst, and, if the road were on a fill, it would be washed out. We have therefore adopted as part of the standards of construction "concrete" and "gravel-surfaced" dips. The road is constructed directly on the bottom of the watercourse and between the points of extreme high water a compact surface of gravel or concrete is provided which is held in place by concrete walls set in the channel bed. This type of crossing is safe, easy riding, and permanent, has a comparatively low cost, and can be easily maintained.

In the construction of projects, existing bridges and culverts have been utilized whenever it was possible and feasible to do so. Some times existing structures have been removed and new ones built, because in improving the alinement or grade of a road the existing structure would not fit the new conditions. Such changes have been made only when it was felt that the additional expense of building a new structure was warranted by the improvement in the road. By far the majority of structures that have been removed and rebuilt were entirely inadequate for the traffic, or were in such poor condition that it was a matter of only a short time until they would require replacement. A large number of small wooden culverts, more or less deteriorated, have been torn out, and permanent concrete or corrugated-iron culverts built in their place.

For all pipe culverts, box culverts, and bridges having a clear span of twenty feet or less, standard plans were prepared which show in detail the method of construction. This assures us of securing a uniformity of construction over the entire State.

All bridges and drainage structures have been designed to carry, in addition to their own weight, a moving load equivalent to a fifteen-ton truck for roadways sixteen feet in width or less, and two such trucks for roadways exceeding sixteen feet in width. Impact has been considered as 30% of the moving load. This seems to be a fair prediction of future traffic. Six-ton trucks are now frequently encountered, which,

with their own weight, means about a 10-ton load. Slow-moving vehicles, such as tractors, have a much smaller impact effect, so that a 20-ton tractor is considered as equivalent to a 15-ton truck.

For bridges having a clear span in excess of twenty feet, the local conditions of the stream-channel and foundation material vary to such an extent that it was thought advisable to treat each structure as a special case.

In 1918 plans were prepared for four special bridges, but, before construction could be started, and, in fact, after bids on one of these projects had been opened, advice was received from the National Highway Council that construction should be postponed. The cessation of war activities enabled us to proceed with these contracts in 1919, and the bridges are now completed and in service. The bridges referred to are the first four described in the following paragraphs.

During the past two years the following bridges, having a clear span in excess of twenty feet, have been completed or are now under construction:

Project No. 1—A reinforced concrete-pile trestle 144 feet long with a roadway 18 feet wide, over the Humboldt River at a point $4\frac{1}{2}$ miles east of Lovelock, completed December, 1919. This bridge, located on the road from Lovelock to Winnemucca, replaces a wooden structure on the old county road which crossed the river at a point about half a mile upstream. The construction of the bridge and one mile of road shortened the distance from Lovelock to Oreana about one mile.

Project No. 2—A reinforced concrete girder bridge 90 feet long with a roadway 18 feet wide over the main canal of the Newlands Irrigation Project, about $1\frac{1}{2}$ miles west of Fallon, completed November, 1919.

Project No. 3—A reinforced concrete-pile trestle 162 feet long with a roadway 18 feet wide over the Carson River about two miles west of Fallon, completed October, 1919. By locating the highway on the south side of the Southern Pacific Railroad two grade-crossings used by the existing county road were eliminated. The existing bridges on the county road over the canal and river were inadequate for heavy traffic—in fact, the river bridge had to be strengthened in order to carry ordinary traffic until Project No. 3 could be completed.

Project No. 8-B—A reinforced concrete-arch bridge of 80 feet clear span and with a roadway 18 feet wide over the West Walker River at Bulkhead, 15 miles southerly from Yerington, completed May, 1920. This bridge in connection with road Projects 8-A and 8-C opened a new avenue for traffic between the Smith and Mason Valleys over a road with easy grades and no high summits, and shortened the distance from Wellington to Yerington about 12 miles.

Project No. 9-B—A reinforced concrete-arch bridge of 35 feet clear span and with a roadway 24 feet wide over Dry Creek, 4 miles south of Reno, on the South Virginia road, completed November, 1920. This bridge replaced a small steel-truss bridge, the members of which were carefully investigated and found to be heavily overstrained for loads then passing over that section of road. Members of the old steel bridge were bent, and the trusses showed a perceptible sag, due to the heavy loads being carried, and it was only a question of time until failure of this structure under some unusual load would cause heavy damage and possibly loss of life. The State was building a road 24 feet wide with

an 18-foot pavement along this section, which would greatly increase the amount of speed of traffic and weight of loads hauled, and the old bridge, being narrow and inadequate as to strength, was considered highly dangerous. When the old bridge was removed it was found that the constant vibration of the structure under loads had practically disintegrated the concrete floor; also it was originally intended that a portion of the north abutment of this bridge would be used in the new structure, but excavation during construction showed a pocket of gravel and sand masquerading as concrete and extending the length of the wall, which made it necessary to replace the wall with new concrete. Included in the construction of this bridge was 115 linear feet of rock wall, necessary to protect adjacent property from stream-wash, which was the consideration for securing additional right of way necessary for the bridge and adjacent road. By locating the new bridge about ten feet east of the old, the alinement of the road was straightened, eliminating two curves which, although of minor consideration, is worthy of mention.

Project No. 22—A steel-truss bridge of 126 feet span and with a roadway 18 feet wide over the Humboldt River near Dunphy, Eureka County, completed December, 1920. This bridge, together with the construction of $2\frac{1}{2}$ miles of new road to be built next spring will route the travel from Battle Mountain to Carlin out of Battle Mountain south of the Southern Pacific Railroad to Shoshone Point, thence across the railroad, river, and bottom lands to a connection with the existing road to Carlin beyond the White House ranch. This new location of the road will eliminate the Boulder Flat, which is undoubtedly the worst stretch of road on the entire northern route across the State.

Project No. 27—A bridge 750 feet long, composed of two steel-truss spans of 126 feet each and the remainder of timber-pile trestle, all with a roadway 16 feet wide. This bridge now being constructed over the Virgin River in Clark County, between Bunkerville and Mesquite, is on the main highway between Utah, southeastern Nevada, and southern California. At present traffic must ford the river at this point, and a team is maintained by Clark County at the crossing to haul vehicles across the river. Frequently the river cannot be forded on account of high water, and traffic is forced to wait until the river recedes.

Project No. 35—A timber-truss bridge 110 feet long with a roadway 16 feet wide over the Muddy River at St. Thomas, Clark County, for which bids are now advertised, will be constructed this winter. A timber bridge is being built here to replace an existing timber structure, which is in an extremely weakened condition due to washouts. The Muddy River, a channel eroded thirty feet deep in the last ten years by waterspouts, has not yet reached a stable condition, and, were a concrete or steel bridge erected here, we might find it rendered entirely useless by further erosion or an entire shift of the river channel.

Along the abandoned grade of the Las Vegas and Tonopah Railroad, between Las Vegas and Beatty, numerous railroad trestles were refloored for highway traffic at a comparatively small cost. The fact that the bents and stringers were in place, and in most cases in excellent condition, and the lumber for flooring was immediately at hand in the ties of the old railroad, effected a large saving to the State on this road.

Material and labor shortage in 1919 caused progress in construction to be rather slow, and during 1920 the labor condition was not a great

deal improved. As this year draws to a close the indications are that the construction program for 1921 will not be so seriously hampered by the labor and material market.



**Reinforced Concrete Pile Trestle over Carson River near Fallon—
137-foot span. Built under Contract 3, Project 3.**



**Reinforced Concrete Pile Trestle near Lovelock—137-foot span.
Built under Contract 1, Project 1.**

THE LAHONTAN PLANT

"The Lahontan Plant" was constructed in the early part of 1920 for the purpose of furnishing sand and gravel for the various paving operations in the vicinity of Reno and Carson City, as well as some materials for concrete structures within a territory permitting freight haul.

Notwithstanding the fact that Nevada is probably the most mountainous of all the States, and there appears to be an ample supply of rock and sand everywhere, it is a fact that there are very few materials of this character which are suitable for highway construction, so that the supplying of these materials has been one of the greatest concern to this department.

At the time the program for the construction of permanent roads in the vicinity of Reno was worked out, it was ascertained that an enormous quantity of material need be furnished from sources which were not developed. The Reno - Carson City road alone required upwards of 7,000 carloads of material. There were no plants in or near the State capable of supplying any of this material, and in this respect we were very unfortunate and unlike other States where large commercial sand, gravel, and rock plants were in existence and in operation.

Certain definite standards for all of the material to be used in these roads were included in the specifications and approved by the federal authorities. These standards were as lenient as we deemed it possible to make them and yet secure a finished roadway of the most durable type.

A material survey of the entire vicinity of Reno was made by members of this department, with the result that very little rock suitably situated met our requirements and no sand except one small pit situated about two miles southwest of Reno. This material survey, aside from the physical examination of the various deposits of material, consisted of a great number of laboratory tests—over seventy-five tests of sand alone being made.

In the early part of 1919 an endeavor was made to contract the furnishing of crushed rock to this department from a rock deposit twelve miles east of Reno which had been acquired by this department at a nominal expense. At first we were unsuccessful in this, but, as a result of continued effort in the way of advertisements, we finally entered into a contract in the latter part of July of that year with Ward Brothers by which they agreed to furnish us 30,000 tons of this material. A plant was constructed by them, but was entirely unsuited to the requirements of the contract, and, after furnishing to us in a desultory manner a small part of the material contracted for, they went into bankruptcy. After failure on our part to make a satisfactory arrangement with the bondsmen to continue the operation of the plant, and because of the inability of the plant to produce material at anything like a reasonable cost, the proposition to obtain more material from Hafed was abandoned.

During the season of 1919 crushed rock was obtained from Hafed, and sand from the Mongolo Pit, southwest of Reno. The supply from these two sources was just about sufficient to meet our requirements for that season; however, we were forced to borrow from the city of Reno about 1,800 tons of material, which was returned during the 1920 season from the Lahontan plant.

After exhausting the supply of sand from the Mongolo Pit and the failure of the contractors to provide crushed rock from Hafed, we were forced to consider other steps to secure material for the 1920 construction. In the early part of the spring of 1920 and after every other means was found unfeasible, the State Highway Engineer was instructed to proceed with the construction of a sand-and-gravel plant at Lahontan, about 65 miles by rail from Reno. The supply at that point is located on the shore line of the Lahontan reservoir, and is the result of the formation of a delta in prehistoric times. The Lahontan Dam was constructed of this material, and considerable information was available to us from explorations made by the Reclamation Service at that time, so that we were sure of material that more than met our requirements as to quality, and for purposes of our road construction the supply was inexhaustible.

The material would, after passing through a properly designed plant, supply us with both sand and gravel, but not in the proportions which we desired, in that the proportion of sand would be such as to give us an excess of that material. The State Highway Engineer interviewed in California several of the concerns engaged in producing sand, gravel, and rock, and found the men who had designed most of the plants on the Pacific Coast. Arrangements were made with them to view the site at Lahontan and design the plant; construction work started with the design.

The plant had to be specially designed for the particular material at hand, and consequently consists of some novel features. The plant is so arranged that the gravel is divided into three separate sizes and then remixed into a gravel for concrete construction. This has been found necessary in all parts of the country in order to secure gravel that will make the concrete of the required density, and consequently the most durable. After the gravel is separated from the material, sand is obtained by a washing process. Five bins constitute the superstructure, the first bin receiving the gravel which is in excess of $2\frac{1}{2}$ inches in diameter and is called the "oversize bin." One bin receives the gravel in sizes from $1\frac{1}{2}$ to $2\frac{1}{2}$ inches; another from $\frac{3}{4}$ to $1\frac{1}{2}$ inches; another from $\frac{3}{8}$ to $\frac{1}{2}$ of an inch; the last being the sand bin. The bins altogether have a capacity of about twelve carloads of material.

The oversize rock obtained in the first bin is run through a crusher and redelivered at the top of the plant and distributed to the various bins other than the one from which it came.

The three sizes of gravel are mixed in their proper proportion by means of a belt conveyor operating in a beltlike fashion from the back of the plant to the cars into which the material is loaded for shipment.

Water for washing the material is obtained from the Lahontan Reservoir, to which a large pipe-line was constructed. Electric power was obtained with which to run the plant itself, the pumps, and to give light. The plant was designed for a capacity of 700 tons in eight hours.

In the construction of this plant and its operation there has been a multiplicity of difficulties and hindrances. The machinery could not be purchased in the open market, and all had to be specially manufactured at a time when material and labor were very difficult to secure by concerns engaged in that business; the matter of securing competent labor with which to construct the plant was very difficult, and

climatic conditions at the site were such as to lend discouragement to any sort of effort by those in charge of the construction. The fact that contracts had already been awarded requiring some of this material made it urgent and imperative that the construction of this plant be completed at the earliest possible date in order to avoid delays in the



View of the Lahontan Sand and Gravel Plant from hill in rear of discharge side of plant. Comparison with gondola cars beside plant gives a good idea of the size of the plant.

paving program for 1920, and this in no small degree had a tendency to make the construction rather costly.

Fortunately the Tonopah branch of the Southern Pacific was only about half a mile from the location of the plant, and it appeared rather easy to install the spur-track, but the requirements of that company were such as to make that installation rather difficult. Notwithstanding their requirements and the difficulties of the situation, the track as installed affords ample car storage and ease of switching. The part of

the switch passing the loading chutes is made in such a manner that the cars can be operated by gravity. The total cost of the plant, excluding the spur-track, but including everything else, such as pumps, hoists, track lines, etc., was \$64,875.82, and originally paid for out of the State Highway Fund. The financing of this undertaking was such, however, that within a period of two years after July 1, 1920, the Federal Government is to reimburse the State to the extent of 50% of the original cost, and Washoe County, to which the major portion of the material is to be shipped, will reimburse the State to the extent of probably 35% of the original cost, dependent somewhat on the manner in which future projects in that county are to be financed. These plans of amortizing the original investment have been agreed upon, first, by a definite arrangement with the federal authorities, and, second, as a part payment of Washoe County's share of the cost of construction of the various projects in that county.

The plant is a success, and the material coming from it more than meets our expectations as to quality, but during the season just closed it is doubtful that there ever was a plant operated under such adverse conditions. An adequate supply of competent labor with which to operate the plant was difficult to maintain, and we were endeavoring to the utmost to keep sufficient men on hand with which to operate the plant through three shifts which we contemplated. The increasing shortage of water in the Lahontan Reservoir required that we move our pumps to different levels to fit new conditions; it was necessary also at the extreme lowness of the water to install a different type of pump from that which we had contemplated using at higher levels. In the midst of the busy part of the season electric power was refused us, so that it became necessary to install, at a great deal of expense and trouble, other power units, and this was done by converting two of our caterpillar tractors into stationary units, and these, while supplying ample power, were not found satisfactory for that purpose, due to the fact that they were being used for something for which they were not designed, and the continuity of the operation had a tendency to require a great deal of repair work.

During the months of July, August, September, and October a total of 21,601.46 tons of material was shipped to Reno, and approximately 5,000 tons of sand were stock-piled at the plant available for shipment. It is contemplated to run this plant as much as possible during the winter months in order that material may be stock-piled for work in the season of 1921.

THE LAS VEGAS AND TONOPAH RAILROAD GRADE

In the fall of 1918 the Las Vegas and Tonopah Railroad Company decided to abandon the operation of its road between Las Vegas in Clark County and Beatty in Nye County, and to dismantle its track. It was observed by some of the far-seeing citizens of Las Vegas that this roadbed, if reconstructed, would make an excellent highway between the extreme southern part of the State and Beatty, and particularly was this desirable, for the reason that the existing highway between those points was in a deplorable condition and was almost impassable at certain seasons of the year.

The territory between Las Vegas and Beatty consists, for almost the entire distance between those points, of an uninhabited desert region,

and, to one unacquainted with its peculiar conditions, very dangerous, so the obtaining of a good highway was not only desirable to provide the comforts of travel, but to act as a protection to those unfamiliar with the region and yet forced to travel it.

The Highway Department was unable to negotiate with the railroad company for the acquisition of this roadbed until it had been designated as a part of our State Highway System. This was done in the early part of the legislative session of 1919. The Highway Department immediately thereafter instructed the Highway Engineer to negotiate with the railroad company for the acquisition of this railroad grade and such of the roadbed structures as might be of advantage to it in reconstructing the grade into a highway. After some negotiation an agreement was entered into with the railroad company whereby, for the consideration of \$3,889.44, the State acquired a quit-claim deed to all of the right of way, a title to all of the bridges which had not theretofore been dismantled, and various other structures, including two wells which might be considered of value to the department. The length of the line involved is 120 miles, so that the value of the grade obtained is, on account of the grade work already done and the bridges installed, many times the price paid for it.

The grade, as left by the railroad company, presented a discouraging appearance in that practically all of the ties were left in place and but little maintenance work had been done upon it during the last few years by the railroad company.

On account of climatic conditions existing in this territory, it is not feasible to do work at any other period of the year than during the winter months.

Following the legislative Act making the acquisition of this grade possible, a very short working period remained in the spring of 1919. Nevertheless, an attempt of a preliminary nature was made for the purpose of determining the best method and equipment needed for performing the work.

During the winter of 1919-1920 considerable work was done on the entire grade from Las Vegas to Beatty, which accomplished the removal of all the ties, the reconstruction of all the bridges which had been left by the railroad company, and the building of other bridges where they had been torn out. The work also consisted of the dragging of the road from one end to the other by a heavy drag so as to remove practically all of the "tie marks." This was all that was possible to do in that season and under the conditions existing at that time. This at once made available for traffic practically the whole of the grade and permitted the department, during the season of 1920, to observe what was necessary to be done in order to make this a first-class highway.

It had first been determined that the work could best be handled by doing it by day-labor forces rather than by contract, for the reason that conditions which might be met by the contractor cannot very well be anticipated and accordingly intelligent specifications written, and this is the reason, probably more than any other, that we desire the State Highway Act so amended at the next session of the Legislature as to permit of the doing of work in this manner.

Along with the acquisition of the railroad grade, we secured all of the original surveys of the railroad company, and have made arrangements with the Federal Government so that no additional surveys of



The L. V. & T. grade after removal of the steel rails. This is the condition of the grade when taken over by the State early in 1919.



Widening of the L. V. & T. grade by the State Highway Department. Grade was cut down 8 to 12 inches and widened to 16 feet.

consequence will be necessary before commencement of construction, and in this respect the purchase price of the railroad grade has been more than saved.

A complete study has been made of the various sections of this grade, so that, as soon as we are authorized to do the work by the proper legislation, we are prepared to improve this entire stretch of road by surfacing the bad sections with gravel, and next year it will be a highway equal to any other section of the State Highway System of the same length.

For all of this, federal aid is obtainable and the arrangements have been worked out whereby no delays will be occasioned by the necessity of presenting formal application for it to the Government.

PROPOSED NATIONAL LEGISLATION

Since such a great incentive is given to highway work in this State by financial assistance of the Federal Government, we are, of course, much interested in the legislation enacted by Congress permitting federal aid to us, or of any other legislation in any manner pertaining to the highway affairs of this State.

When the department was organized we felt that, because of certain conditions existing in the State, the Federal Government should in some manner assist us in a larger way than theretofore proposed. As Nevada holds the unique position of being a sort of barrier between the East and West, we believe the East and West themselves should attempt to make their own connections across our State. It is not generally appreciated, but, nevertheless, it is a fact, that over one-fourth of the unappropriated public lands of the United States are within the confines of the State of Nevada, and those public lands constitute 90.6% of the entire area of our State. These lands are unproductive and in no sense are they a source of revenue to the State. The entire administration of their affairs, except the matter of police regulation, rests in the hands of the federal authorities. We believe it to be a duty of the Federal Government in some manner to care for road construction and maintenance across these vast areas; and we further feel that it is an obligation upon the part of the Federal Government. This is accentuated somewhat by the fact that the small percentage of privately owned land is mostly concentrated in one or two highly productive sections of the State, leaving the major portion of our area practically all government lands.

The feeling of the members of this department that adequate recognition should be made of these accounts was presented to the federal authorities more than two years ago, and an endeavor has since been made by those in authority in Washington, by the American Association of State Highway Officials, and by various other organizations to have appropriate legislation enacted by Congress to change the proportion of federal aid money to this State in such a manner that some recognition would be given. Success has not followed these efforts as yet; however, at the last session of Congress a great amount of discussion was had of various bills which were introduced having this as their object. It is noteworthy in this connection that the platform of each of the two great political parties makes mention of the necessity of such legislation and both endorse it.

Within a very short time, and possibly at the next session of Congress,

there will be enacted new highway legislation with appropriations greater than any heretofore made. This legislation will undoubtedly be of one or two characters: first, the amendment and extension of the present Federal Aid Road Act, and, second, the creation of a Federal Highway Commission and the establishment of a National Highway System.

It is difficult for us to determine just which one of these measures would be of the greater benefit to our State, and we are watching with considerable patience the trend of opinion toward each of them, and suggesting, wherever possible, additions or amendments that would ultimately make either of them more beneficial to us.

Only a brief statement of the aims and purposes of these measures will be made in this report.

The extension of the Federal Aid Road Act would provide a much larger amount of money for the continuance of road construction on a cooperative basis with the Federal Government, the work on their part to be handled by the present Bureau of Public Roads, which is a part of the Department of Agriculture.

The Townsend bill provides for the creation of a Federal Highway Commission similar in authority and function to the Isthmian Canal Commission charged with the construction of the Panama Canal; and the designation, construction, and maintenance of a National Highway

System, a part of which would be located through Nevada, probably to consist of one road east and west across the State and one road north and south.

In the event of the passage of the Townsend bill, we would be relieved of the construction and maintenance of two transstate roads, and the Government would concentrate all of its energies toward the construction and maintenance of such roads, thus requiring but very little on the part of the State, which would be asked to furnish all necessary rights of way to the Government.

PROPOSED NEW STATE LEGISLATION

With the completion of the construction of a part of our State Highway System, and particularly since that has been done during a period of very adverse conditions of every nature, it has developed that a more efficient and satisfactory carrying on of the work can be had by certain changes in our present State Highway Act, and the department would suggest that very careful consideration be given to the following recommendations:

It is apparent, if state highway construction in Nevada is to continue with the same rapidity as federal aid money becomes available, that considerable thought must be given to the matter of financing the work on the part of the State and the various counties. We are opposed to long-term bond issues redeemed by direct taxation, except where no



other method can be provided. We desire at this time to keep to a minimum the direct tax on property, and suggest, in lieu of this, that more consideration be given to the licensing of automobiles and trucks, and especially a special license fee imposed upon those automobiles and motor trucks acting as public carriers. This last is deemed necessary, for the reason that in this manner taxes can be imposed upon those carriers that are comparable in some degree to the taxes paid by other transportation companies, such as railroads, and also to derive from them a fund with which to maintain the roadbed they are constantly using, and thus again making their service comparable to other transportation companies who are required to maintain their own roadbed.

Another source of revenue for state highway purposes is that form of a consumer's tax which collects an excise tax on the sale of gasoline. This is comparatively a new form of taxation, but where it has been tried out it is considered with much favor. Its particular advantages are that the one who uses the road most is required to pay the most for its upkeep, and it derives a revenue from the tourists who traverse the roads of our State, but live elsewhere.

Other means of revenue may be devised by the Legislature for the purpose of replenishing the State Highway Fund directly or as a means of retiring bond issues. Within the next two years, and before the Legislature convenes again, it will be necessary for the Highway Department to enter in certain cooperative agreements with the Secretary of Agriculture in order to retain certain additional federal money in this State amounting to \$2,276,992.29, which has been allotted to it; and one of the necessities of being able to enter into such agreements is that an equal amount of state and county funds be available with which to meet the requirements of the Federal Aid Act.

Another suggestion of your Highway Department is that in some manner the State Highway Act be amended so that a closer cooperation both in the financing and actual doing of the work be had with the several counties. This is deemed advisable in order that those people who more directly assist in the financing of the work might have more of a voice in its expenditure.

The Federal Aid Road Act provides a basis of cooperation between the Federal Government and the several States, and in that respect it has been found to be a success, and, on the basis of the same proposition governing that success, we believe careful consideration should be given to a closer cooperation with the various counties, probably to the point of each county having its own engineer, subject, of course, to the approval and sufferance of the Highway Department. There are many limitations to such an idea, principally defined by the requirements and regulations of the Federal Aid Road Act.

The highway law, in so far as it pertains to the condemnation of property for rights of way, should be amended in such a manner that there is no doubt of the right of the department to acquire property in this manner, and, particularly, obtain immediate possession once it decides that it is necessary.

At present a limitation is placed upon the department as to the amount of construction work which can be done other than by contract. During the existence of this department a multiplicity of adverse conditions have discouraged contractors in bidding, so that in a great many cases we have not received any bids in response to our advertisements.

It has not always been due to the scarcity of contractors, nor has it been attributed to their inability to do work in this State, but can be traced to their inability to provide ample finances with which to carry on the work; their inability to foresee labor conditions, and to the fact that much of the work contemplated to be done is surrounded by conditions of more or less unknown definiteness, such as deposits of material for gravel surfacing and concrete structures. Ofttimes but one bid has been received in response to our advertising, and there is a great deal of hesitancy on the part of the department to award contracts under such conditions, for the very reason that such a bid does not show competition. The following table will show this condition in a condensed manner:

	<i>Number</i>	<i>Percentage</i>
Times advertisements made and no bids received.....	3	5.8
Times advertisements made and one bid received.....	11	21.2
Times advertisements made and two or more bids received.....	38	73.0



**View of Portion of State Highway through Wilson Canyon
in Lyon County.**

There are certain classes of work which can be done to better advantage to the public by direct day-labor work than through a contractor's organization, and particularly is this true of the reconstruction of the old L. V. & T. R. R. grade in southern Nevada, where the uncertainties surrounding the doing of the work are such as to almost preclude their intelligent anticipation for the purpose of writing specifications and making advertisements for competitive bidding.

There have been cases where the contractor, for some reason or other, has not been able to complete his work or has been doing it in such an unsatisfactory manner that it is necessary for the State to do it in order to secure a completed project satisfactory to not only ourselves but to the Federal Government, and in such cases it is necessary for the State to complete the work by day-labor organization. For these reasons we believe that the Highway Act should be so amended as to give the Highway Department authority in its discretion to do work in this manner.

The department, as a general proposition, does not approve of the extension of the State Highway System, for the reason that the task outlined by the designation of the present system is sufficient to occupy the energy of the department for some time to come. The department will, however, lend its approval to the obtaining of federal aid by any county for any road project within its confines on which federal aid may be secured. Such projects must be financed by the county to the extent of that portion of the cost not obtainable from the Federal Government. .

THE PROPOSED \$450,000 DONATION OF NORTHERN CALIFORNIA

The Overland Trail Club was organized in the early part of 1917 and is purely a Nevada organization. Its object is to secure an early improvement of the road traversing the northern part of the State through the cities of Elko, Carlin, Battle Mountain, Winnemucca, Lovelock, and Reno, which route has since been designated as State Highway Route No. 1.

Included in the membership of the Overland Trail Club are some of the most active and successful business men of northern Nevada, and they have seen fit to select as their leader Mr. W. H. Goodin of Lovelock, than whom there is no better informed man in this State on road matters nor a more energetic booster.

One of the early activities of this association was the reconstruction of a highway over an old abandoned railroad grade from Lovelock to Reno, a distance of approximately 100 miles. This association, through members in that vicinity, made successful efforts to secure contributions of money from the business men of Reno and Lovelock with which to buy drainage culverts, and they acquired the services on Sundays and holidays of a great many of the business men of these communities to aid in their installation and otherwise reconstruct and improve the old grade, so that within a very short period of time a good passable road was obtained between Reno and the northern counties of Nevada.

Within the past two or three years it has developed that certain interests in northern California, being desirous of providing an inducement to eastern tourists to visit that region, have been investigating what could be done toward the accomplishment of that desire. They have concluded that the lending of financial assistance to an improved road across Nevada would best serve their purpose, and considerable effort has been made to raise the funds with which to assist the State of Nevada in the early improvement of one highway.

Northern California people, after their own investigation, selected the Overland Trail as the highway to which they would lend their financial aid, should any such aid be available. Since that selection, and all during the period of effort on the part of the northern California interests, Mr. Goodin and the Overland Trail Club have been quite active in the effort to cooperate both in a financial way and to the more early securing of money which might be given their road.

The understanding between the Overland Trail Club and California was that northern California would contribute \$450,000, providing the northern counties through Nevada would contribute a like sum by bond issues, it being understood that the total of these two amounts would be used for the obtaining of federal aid. At the last session of the Legislature provision was made by that body for the authorizing of the

various counties through which this road passed to issue bonds in a total sum of \$450,000, providing California was able to keep its promise.

Within the past two years many meetings have been held in northern California, having for their object plans for the raising of this large sum of money, but due to various causes it has not yet been made available to the Highway Department nor is it understood that any portion of it has been obtained by the California interests.

Reports coming to us indicate that the people of northern California who are interested in this project of financial assistance for the Overland Trail are still quite enthusiastic about it, and that they are still endeavoring to find ways and means of raising the money.

It is very probable, therefore, that at the next session of the Legislature the Overland Trail Club and the northern California interests will have devised some definite plan whereby it will be deemed necessary by the Overland Trail Club that authorizations be given to the



Installing Armco Culverts on old railroad grade between Reno and Lovelock by the Overland Trail Club, Spring of 1917.

various counties in northern Nevada to meet their share of this agreement, should the pledge of the northern California interests be kept.

The bond-issue authorizations provided at the last session of the Legislature for the purpose of meeting the contribution of northern California interests have all expired by limitation.

LINCOLN HIGHWAY DONATIONS

The Lincoln Highway Association was one of the first organizations of the country to designate a transcontinental highway, and ever since the inception of the organization it has made an admirable fight for its early improvement. Too much cannot be said of the energy and unselfish spirit displayed by the founders of this organization in attaining an improved and connected road from the Atlantic seaboard to the Pacific Coast. True it is that many in different sections of the country have differed with the ideas of this association in the way of location, and what is true of other sections of the country is likewise the case in Nevada.

Through this State they designated as a portion of the Lincoln Highway what has since been designated by our Legislature as Route 2 of the State Highway System, being that route passing through Ely, Eureka, Austin, Fallon, and Reno, and they have concentrated their efforts upon this route with a tenacity of purpose that cannot help but call forth the admiration of those who might disagree with their ideas of location.

The efforts of the association include a raising of funds by voluntary contributions from eastern people to assist in the early improvement of sections of this highway across those areas of the country where finances would otherwise preclude the doing of the work, and thus, in no small degree, they take the function that we believe should belong to the Federal Government, on account of the enormous area of publicly owned lands.

Previous to last year much had been said of the funds which this organization had available for the State of Nevada, but nothing tangible had been received and no definite arrangements had been made toward securing them. In July of 1919, and after considerable correspondence had passed between the members of this department and the association, the State Highway Engineer was instructed to confer with the various officials of the Lincoln Highway Association in Detroit, Mich., and Akron, Ohio. As a result of these conferences the sum of \$120,000 was made available to this State for assistance in the improvement of specific projects on the Lincoln Highway, the details of which are later mentioned in this chapter.

The General Motors Company, through Mr. W. C. Durant, its president, contributed to the Lincoln Highway Association \$100,000 of this fund and the Willys-Overland Company \$20,000.

The Lincoln Highway Association, in contributing this money to the State, was desirous of securing an early completion of those sections of the Lincoln Highway which were then in a poor condition, and, as a consequence, certain definite agreements were made pertaining to the improvement of certain specific sections.

The money obtained from the Lincoln Highway Association would not of itself permit of the improvement of those sections along the lines desired by this department, but with state money, county funds, and that which could be obtained from the Federal Government, would materially assist and be a spur to their early improvement.

The projects which were enumerated by the Lincoln Highway Association and for which agreements have been entered into between the association and this department are as follows:

(1) Churchill County—The road across the Fallon Sink, being between Grimes Ranch and Sand Springs, a distance of approximately 17.3 miles; donated by the Lincoln Highway Association, \$45,500.

(2) Churchill County—The Mud Flats immediately east of Frenchman's Station, from a point $1\frac{1}{4}$ miles west of Frenchman's Station to a point $3\frac{1}{4}$ miles east thereof; Lincoln Highway funds, \$10,000.

(3) Churchill County—Between Eastgate and Westgate, approximately 15 miles; funds provided by the Lincoln Highway Association, \$7,500.

(4) Eureka County—Between Eureka and Hay Ranch, a distance of about 12 miles; Lincoln Highway Association, \$7,500.

3. **White Pine County**—From Moorman's Ranch to a point 22 miles west thereof via Little Antelope Summit: \$7,500 provided by the Lincoln Highway Association.

4. **Elko and Lander Counties**—Between Eastgate and Austin, a distance of approximately 75 miles: contributed by the Lincoln Highway Association. \$12,000.

At the time of the conference with the Lincoln Highway officials definite information was had of the first five of these projects, and, in accordance with an understanding reached, the money made available for the improvement of them was deposited in Nevada banks, obtainable by the department as the construction work proceeded; \$78,000 was made available immediately, of which \$16,380 has actually been expended by the department on account of construction heretofore accomplished.

At the time of the conference information was not available as to the proper location of the state highway between Eastgate and Austin, as the department had not then had an opportunity to investigate this territory with any sort of thoroughness. The association did, however, agree that upon the designation of this route by the engineers of the Highway Department the money would be made forthcoming. Since that time quite a thorough reconnaissance has been made of the territory, not only by the officials of the Lincoln Highway Association, but by engineers of the Federal Government and this department. As a result of this, the Lincoln Highway Association has informed us by letter that it is agreeable to depositing the money as for the other projects should we select the route via Newpass or Carol Summit, but that it did not look with favor upon the routes which have been investigated via Burnt Cabin Summit or the Upper Reese River Valley.

In the chapters pertaining to the various counties, mention is made of each of the above projects in detail. Suffice it to say here that, on account of unavoidable delays, the high prices surrounding the doing of work during this last biennial period, and the prohibiting of the doing of work by other than contract, we have been unable to do as much of this construction as was first contemplated. A considerable part of the work to be done across the Fallon Sink has been finished, and in a manner bringing forth the highest praise from the officials of the Lincoln Highway Association. Advertisements were made of the Eureka-Hay Ranch project, but without success; other projects have been surveyed and approved by the Federal Government.

Certain definite time-limits were included in the agreements with the Lincoln Highway Association, but the officials of that organization have indicated their willingness to extend the limits in order that the aid may be forthcoming during the next season.

Too much praise cannot be given to the officials of the Lincoln Highway Association by the people of this State, not only for their magnanimity of spirit, but for the enthusiasm with which they have made this contribution and with which they have entered into the working out of the many details involved in the proposed construction.

**Table Showing Projects To Be Constructed with the Aid of the Donations of the
Lincoln Highway Association**

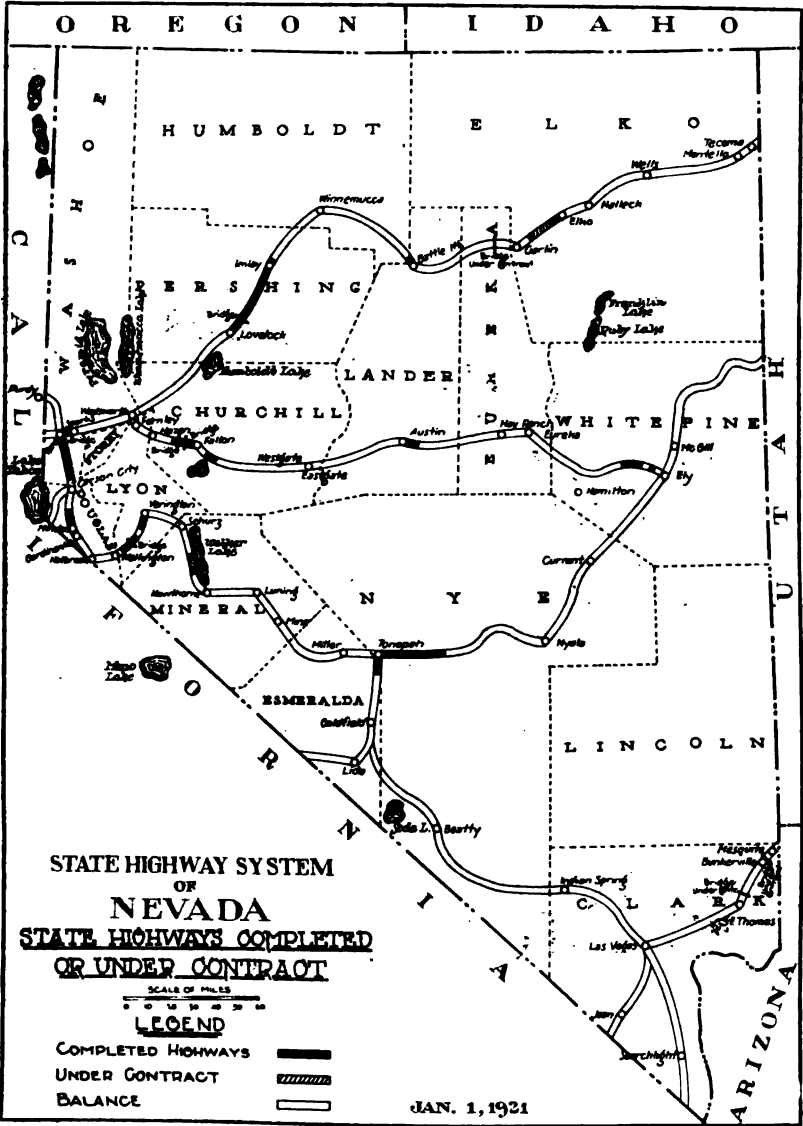
<i>Proj. No.</i>	<i>Location</i>	<i>Amount</i>
1.	From Grimes Ranch to Sand Springs, Churchill County.....	\$45,500.00
2.	Across Frenchman's Flat, Churchill County.....	10,000.00
3.	From Westgate to Eastgate, Churchill County.....	7,500.00
4.	From Eureka to Hay Ranch, Eureka County.....	7,500.00
5.	From Illpah to Fourteen-Mile House, Antelope Summit, White Pine County.....	7,500.00
	Total placed in escrow with Carson Valley Bank.....	\$78,000.00
ADDITIONAL DEPOSIT TO BE MADE		
6.	Eastgate to Austin, Churchill and Lander Counties.....	42,000.00
	Total donation of Lincoln Highway Association.....	\$120,000.00
	Payments made to State during 1920.....	16,380.00
	Available balance of donation.....	\$103,620.00



Freighting Outfit crossing the eight-mile flat of the famous Fallon Sink.



**Dragline Excavator making the fill across the Fallon Sink.
Contract 17, Project 24.**



THE CENTRAL MIXING PLANT

The following series of illustrations show the operation of the central mixing plant as operated on Contract 28 in Washoe County during the season of 1920. This was the first instance of the use of this type of plant in the West. Its operation proved very successful, and the same method will be used in the future wherever possible.



Unloading the Aggregate from Car to Stock Pile with Clam-Shell Bucket.



Loading the Aggregate from Stock Pile into Mixing Bins of Plant.



**Filling the Batch Compartment Trucks with Mixed Aggregate
at the Mixing Plant.**



Dumping the Mixed Aggregate from Truck into Hopper of Concrete Mixer.



Dumping the Dry-Mixed Aggregate into the Mixing Drum.



Spreading and Tamping the Poured Concrete.



Rolling the Pavement with the Mason Squeegee Roller Immediately after Pouring.



Finishing the Pavement Surface by the Belt Method



Curing of the Pavement During Set by the Ponding Method.



The Completed Pavement Opened to Traffic. Shoulders not yet completed.

TABULATION OF FEDERAL AID PROJECTS

<i>Proj. No.</i>	<i>Designation</i>	<i>Estimated cost</i>	<i>Federal share</i>	<i>Amount under agreement</i>
1.....	Persh. 1-C.....	\$124,018.08	\$62,009.04	\$60,234.49
2.....	Nye 4-A.....	44,120.44	22,060.22	22,060.22
3.....	Chur. 2-B.....	94,348.72	47,174.36	47,174.36
4.....	Doug. 3-B.....	19,949.60	9,974.80	4,942.85
5.....	Elko 1-A-1.....	98,066.56	49,033.28	49,033.28
6.....	White Pine 2-C-1.....	75,603.79	37,801.89	31,923.10
7.....	Washoe 3-A-1.....	373,915.28	186,400.00	186,400.00
8.....	Lyon 3-C.....	70,532.51	35,266.25	35,266.25
9.....	Washoe 3-B.....	194,907.27	97,453.63	80,634.87
10.....	W. P. 2-C-2.....	94,000.50	47,000.25	
11.....	Esmer. 3-C-1.....	44,337.86	22,168.93	22,168.93
12.....	Lyon 3-D-1.....	25,609.29	12,804.64	12,804.64
13.....	Nye 4-D-1.....	40,700.00	20,350.00	
14.....	Doug. 3-C-1.....	44,063.65	22,031.82	15,146.45
15.....	Elko 1-A-2.....	42,269.15	21,134.57	21,134.57
16.....	Lander 1-A-1.....	28,454.80	14,227.40	14,227.40
17.....	Lyon 3-B-1.....	46,310.11	23,155.05	23,155.05
18.....	Elko 1-B.....	229,285.32	114,642.66	
19.....	Persh. 1-D.....	103,718.20	51,859.10	51,859.10
20.....	Doug. 3-B-1.....	11,734.58	5,867.29	
21.....	Washoe 1-B-1.....	42,407.07	19,400.00	19,400.00
22.....	Eureka 1-A-1.....	108,823.99	54,411.99	54,411.99
23.....	Mineral 3-E.....	202,269.65	101,134.82	91,678.95
24.....	Chur. 2-C-1.....	104,500.00	52,250.00	52,250.00
25.....	W. P. 2-C-2.....	8,255.22	4,127.61	4,127.61
26.....	Washoe 1-A-1.....	153,168.40	76,584.20	
27.....	Clark 6-G-1.....	87,407.10	43,703.55	43,703.55
28.....	Doug. 3-B-3.....	79,753.74	36,000.00	36,000.00
29.....	Washoe 3-A-2.....	456,589.68	209,400.00	207,457.64
30.....	Ormsby 3-C.....	138,370.67	69,185.33	63,088.59
31.....	Eureka 2-B.....	86,402.80	43,201.40	
32.....	Humboldt 1-D.....	68,530.00	34,265.00	
33.....	Lyon 3-B-2.....	82,955.29	41,477.64	
34.....	Chur. 1-A-1.....	121,148.80	60,574.40	
35.....	Clark 6-F-1.....	7,491.00	3,745.50	
36.....	Reno-Purdy.....	144,160.30	72,080.15	
37.....	Clark 6-E-1.....	80,589.74	40,294.87	
Totals.....		\$3,778,769.16	\$1,864,251.64	\$1,250,283.89

REPORT OF THE DEPARTMENT OF HIGHWAYS

STATEMENT OF RECEIPTS

Class of income	1917-1918	1919	1920	Grand total revenue	Grand total refunds	Grand total receipts
Legislative appropriation	\$40,000.00			\$40,000.00		\$40,000.00
Taxes, net amount received	181,060.33	\$194,941.22	\$113,000.86	488,992.41		488,992.41
Taxes, Storey County (later refunded)		2,379.88		2,379.88		2,379.88
Taxes, Lincoln County (later refunded)		9,249.58		9,249.58		9,249.58
Automobile licenses	63,851.10	30,738.25	329.75	94,589.30		94,589.30
Racing Commission fees	17,024.99	7,451.92	20,065.18	44,532.09		44,532.09
Special deposit, Lyon County		10,000.00		10,000.00		10,000.00
Truck rentals		50.00		1,109.70		1,109.70
Lincoln Highway Association			1,069.70	16,380.00		16,380.00
Miscellaneous refunds	196.16	181.89	10,678.01		\$11,045.06	11,045.06
Sales of department property		48.94	2,507.52	2,556.46		2,556.46
Equipment refunds from counties		7,631.62	81,250.95		88,882.57	88,882.57
Right-of-way purchase refunds		6,076.78			6,076.78	6,076.78
Construction refunds by counties		78,982.23	225,211.33		304,193.56	304,193.56
Construction refunds by Federal Government		125,570.65	385,905.73		511,477.38	511,477.38
State bonds issued and sold			475,000.00	475,000.00		475,000.00
Total receipts by year totals	\$302,121.55	\$478,302.96	\$1,281,380.08			
Grand total revenue			\$1,184,789.42			
Grand total of refunds					\$871,675.35	
Grand total of receipts						\$2,056,464.77

STATEMENT OF DISBURSEMENTS

Classification of disbursements	1917-1918	1919	1920	Grand total
<i>Asset Accounts</i>				
Contract payments and engineering on contracts		\$345,882.71	\$963,138.49	\$1,209,021.20
Construction materials furnished by State		46,011.81	233,914.99	\$279,926.80
Operation of contracts taken over by State			12,424.83	12,424.83
Construction payments under section 8, Federal Aid Act			60,906.76	60,906.76
Lahontan sand-and-gravel plant—Inventory value			62,969.66	62,969.66
Reno Material Yard—Inventory value			37,194.09	37,194.09
Reno Material Yard—Inventory value of stock			6,716.60	6,716.60
Hafed Quarry Plant		1,415.08	3,028.17	4,443.20
Equipment inventory accounts	\$34,662.09	47,690.90	28,963.62	101,296.51
Delivery costs of surplus war materials		36,146.00	41,281.06	77,427.06
County tax refunds (Section 31, Highway Law)		11,629.46		11,629.46
Accounts receivable—All sources		16,115.68		16,115.68
Reno plant operating account			48,204.69	48,204.69
Surveys	28,506.20	30,880.13	44,673.64	104,059.97
Plans and estimates	5,663.16	6,711.76	7,456.38	19,830.29
Bridge layouts		834.04	876.86	1,710.89
Rights of way purchased	1,905.27	9,963.02		11,868.29
Military information for Federal Government	1,896.35			1,896.35
State road map compilation		100.34	926.40	1,026.74
Maintenance expenditures	16,596.54	29,300.21	44,121.16	90,047.91
General administration—Headquarters	33,063.06	38,222.73	61,816.39	112,622.18
General administration—Division No. 1, Las Vegas			4,998.56	4,998.56
General administration—Division No. 2, Reno			2,912.37	2,912.37
Revolving and emergency funds (transfers only)	2,500.00	7,500.00	10,000.00	20,000.00
Less credit regular entries (department transactions)				
Less profit account Reno plant operation			\$33,963.63	\$33,963.63
Net total disbursements	\$114,812.66	\$627,963.72	\$1,563,966.75	\$2,296,163.13

TABLE SHOWING FEDERAL AID ALLOTMENTS TO NEVADA

Fiscal year	From—	Funds allotted			Status of allotments		
		Act of 1916	Amendment of 1919	Totals	(Covered by proj. agmt.	Not covered by proj. agmt.	Payments to State
1917	July 1, 1916, to June 30, 1917.	964,898.30		964,898.30	964,898.30		964,898.30
1918	July 1, 1917, to June 30, 1918	128,796.60		128,796.60	128,796.60		128,796.60
1919	July 1, 1918, to June 30, 1919	196,229.82	9642,983.46	896,163.28	896,163.28		896,163.28
1920	July 1, 1919, to June 30, 1920.	287,173.88	964,400.19	1,251,673.67	220,925.71	\$1,030,647.96	315,282.46
1921	July 1, 1920, to June 30, 1921.	319,086.11	967,286.32	1,276,344.43		1,276,344.43	
	First Act.....	962,664.21					
	Amended Act.....		\$2,664,601.97				
	Grand total allotted			\$3,627,276.18			
	Now covered by project agreements				\$1,250,283.89		
	To be covered by project agreements						
	Total payments to State to November 30, 1920					\$2,276,992.29	\$611,477.88

TABLE SHOWING PROJECTED AND COMPLETED CONSTRUCTION BY PROJECT STATEMENTS

Project No.	County	Location of section of improvement	Biennial period 1919-1920— Completed construction mileage			For season of 1921— Uncompleted contracts				Approved project statements			
			Concrete	Gravel	Grading	Bridges over 20-ft. span	No. and length	Type	Concrete	Gravel	Grading	Bridges	
1	Pershing	Lovelock to Zala		16.70			1-144	Concrete.					
2	Nye	Tonopah to Toiyabe National Forest		14.76			2-281	Concrete.					
3	Churchill	Cañon to Mesquite		1.01									
4	Houder	Carters to Hithbrook											4.00

Section	Location	Material	Quantity	Unit Price	Total	Remarks
5	Elko	Elko to Vivian	4.41	14.32		
6	White Pine	Keystone to Robinson Summit	12.46			
7	Washoe	Ruffaker's to Washoe Summit	3.85	5.47		
8	Lyon	Wilson's to Bulkhead	6.42			
9	Washoe	Reno to Huffaker's	6.42			
10	White Pine	Robinson Summit to Ilipah	8.93			
11	Emeralda	Tonopah to Miller's cut-off road	1.00			
12	Lyon	Smith's Corners to Hudson-Aurora road	1.27			
13	Nye	Butler's ranch to Troy road	1.61			
14	Douglas	Minden to a point 3½ miles north	8.52	1.84		
15	Elko	West county-line to Vivian	5.72			
16	Lander	West county-line to Battle Mountain	21.85	6.87		
17	Lyon	Yerington to a point 5.72 miles south	0.97			
18	Elko	Elko to Mill City	5.00			
19	Pershing	Zola to Mill City	10.42			
20	Douglas	Carters to a point 2 miles north	0.23			
21	Washoe	Reno to Sparks	5.00			
22	Eureka	West county-line to White House Ranch	1.84			
23	Mineral	Cottonwood Creek to a point 9.3 miles north	1.76			
24	Churchill	1.3 miles east Salt Wells to Sand Springs	1.84			
25	White Pine	Keystone to Lane City	1.84			
26	Washoe	Reno to Lawton's	1.84			
27	Clark	Bridges over Virgin River	1.84			
28	Douglas	Gardnerville to Minden	1.84			
29	Washoe	Washoe Summit to Lakeview	1.84			
30	Ormsby	Lakeview to Carson City	1.84			
31	Eureka	Hay Ranch to Eureka	1.84			
32	Humboldt	Wilby to east county line	1.84			
33	Lyon	Wilby to east county line	1.84			
34	Clark	Hazen to Lesterville	1.84			
35	Clark	Bridges over Muddy River	1.84			
36	Washoe	Reno to Purdy	1.84			
37	Clark	30.1 mi. sw. St. Thomas to point 16.79 mi. sw. St. Thomas	1.84			
Section 8 Work						
Nye	Tonopah Project		13.00			
Lander	Austin-Eureka Project		10.00			
Totals			13.79	64.26	89.03	
			8.41	22.03	9.11	
			747 ft.	22.77	53.45	
					46.81	
					110 ft.	

TABLE SHOWING STATE CONTINGENT LIABILITY ON UNCOMPLETED CONTRACTS

County	Location				Estimated cost pay- ments to complete present contracts	Distribution of liability costs		
	Route	Section	Contract No.	Project No.		Estimated federal share	Estimated county share	Estimated state share
Lyon	3	C	5	8-B	\$4,808.18	\$2,269.84	\$2,538.34	\$4,783.67
White Pine	2	C	7	6	19,134.67	9,567.33	4,783.67	14,303.12
Niko	1	A	8	6	49,821.12	20,714.88	14,303.12	6,060.00
Washoe	3	B	12	9	20,200.00	10,100.00	5,050.00	
Douglas	3	A	14	7	2,000.00	1,000.00	1,000.00	
Douglas	3	C	15	14	1,500.00	750.00	375.00	
Churchill	2	B	16	3	9,325.52	4,196.48	2,098.24	
Churchill	1	C	20	1	7,492.98	3,746.49	1,873.24	
Mineral	3	E	22	23	110,532.31	55,266.15	29,643.73	
Churchill	1	D	26	19	46,116.32	23,058.16	11,279.08	
Washoe	3	A-1	23	7	199,167.78	99,578.89	69,706.22	
Washoe	3	A-2	29	29	113,746.00	56,372.60	41,660.75	
Clark	6	G	30	27	60,881.83	25,415.91	12,707.96	
Lyon	3	D	34	12	6,682.82	3,341.31	1,670.65	
Yurela	1	A	36	22	4,194.54	2,097.27	1,048.63	
Douglas	3	B	36	28	23,649.79	9,860.91	11,308.90	
Washoe	3	A-2	37	29-B	19,312.88	9,656.44	6,789.60	
Washoe	3	A-2	38	29-B	22,846.20	11,423.60	6,711.30	
Douglas	3	C	39	14	14,466.87	7,233.44	3,616.71	
Clark	6	F	40	26	7,491.00	3,745.50	1,872.75	
Grand totals					\$736,708.61	\$361,914.10	\$229,578.08	\$146,216.48

CONSTRUCTION REIMBURSEMENTS AND AMOUNTS DUE STATE

Contract No.	Total cost payments to November 30, 1920	Federal Government				County participation			Financing by State		
		Total federal share	Status of federal payments		Total county share	Status of county payments		Share of cost assessed to State	Now carried due from government and counties		
			Paid	Vouchered		Paid	Vouchered				
1.	\$13,298.91	\$6,540.25	\$5,073.28	\$1,466.97	\$3,374.36	\$2,822.23	\$52.13	\$3,374.36	\$1,519.10		
2.	7,081.76	3,884.74	2,851.23	826.65	1,833.56	1,833.46	.09	1,833.56	653.66		
3.	14,018.59	6,625.77	5,144.28	926.84	3,643.96	3,643.64	.41	3,643.97	1,681.90		
4.	29,698.96	11,734.36	11,372.53	361.82	10,940.11	10,936.79		6,962.62	1,876.14		
5.	7,819.01	3,674.53	6,431.81		4,144.48	1,326.90			1,060.80		
6.	49,531.86	24,765.96	18,889.56	6,876.39	17,362.97	12,362.97		12,362.96	6,027.36		
7.	61,649.87	27,882.42	22,397.81	6,484.61	17,219.03	16,036.29		16,798.42	10,128.07		
8.	68,791.36	28,892.39	27,514.98	1,377.41	17,181.09	8,843.30		18,715.38	1,377.41		
9.	83,290.93	26,640.48	18,131.62	8,508.84	13,320.26	11,701.03		13,320.21	7,809.79		
10.	30,146.82	14,543.60	14,227.40	16.20	28,768.26	14,290.80		16.20	21,967.30		
11.	64,260.82	25,602.62	18,103.22	7,399.34	28,768.26	14,290.80		18,980.63	38,136.92		
12.	193,719.63	96,710.77	63,352.60	21,471.41	82,554.23	46,796.48		46,796.48	27,048.94		
13.	46,448.94	21,064.88	19,400.00	10,906.76	23,133.59	16,945.04		5,849.57	838.58		
14.	44,218.47	21,064.88	17,020.77	3,871.12	7,508.66	7,508.66		6,492.35	10,282.66		
15.	25,992.02	12,996.02	8,972.98	1,642.69	20,798.38	10,680.66		3,966.48	4,023.04		
16.	80,683.12	39,241.29	19,872.00	14,400.49	21,768.92	16,390.00		5,644.96	29,664.06		
17.	60,902.62	33,042.67	33,042.67		12,778.92	8,019.02		24.93	6,997.76		
18.	48,222.17	22,664.40	20,426.54	2,237.86	2,632.83	2,632.83		4,734.97	140.78		
19.	6,305.06	2,632.62	2,511.74	140.78	2,632.83	2,632.83		2,960.09	6,837.98		
20.	99,376.45	49,688.24	45,810.35	3,877.89	15,613.69	15,356.66		24,844.08	17,628.98		
21.	82,490.39	41,245.19	33,966.62	7,278.67	22,272.41	11,722.10		10,550.31	4,124.73		
22.	6,625.34	6,625.34			4,647.04	4,613.83		18,972.79	6,837.98		
23.	81,908.41	28,812.86	3,061.60	34.46	15,954.42	13,788.09		3,049.61	17,628.98		
24.	10,477.49	8,048.13	2,429.36	2,429.36	6,466.34	2,161.33		16,954.40	6,968.66		
25.	106,696.61	53,348.30	43,866.39	4,016.43	37,343.81	3,257.60		16,171.21	3,257.29		
26.	86,812.77	43,812.77	21,487.06	6,902.86	30,196.27	18,357.91		18,409.22	81,998.03		
27.	3,001.62	1,401.82	1,401.82	1,401.82	980.67	160.97		3,111.68	33,617.49		
28.	12,063.56	6,762.76	6,762.76	573.20	3,674.14	3,219.61		890.60	2,871.39		
29.	5,360.80	2,668.39	2,668.39	676.42	1,987.96	1,381.39		381.27	6,237.29		
30.	7,681.76	3,796.88	3,796.88	3,796.88	1,987.96	1,381.39		266.71	1,077.44		
31.	16,598.56	8,299.28	6,649.90	1,649.38	4,149.64	561.03		32.05	6,693.83		
32.	3,916.68	1,968.34	1,829.70	128.64	979.17	1,733.01		1,865.60	11,867.89		
33.	63,862.63	26,822.29	26,822.29		30,664.07	16,415.47		112.14	9,979.17		
34.	10,712.08	6,366.03	4,081.19	1,274.84	3,749.25	1,906.96		6,386.27	41,060.89		
35.	772.79	386.40		386.40	270.49			115.90	9,106.28		
Section 8											
1-8	22,516.83							22,516.83	3,587.04		
2-8	31,000.00				15,500.00	11,912.96		15,500.00			
3-8	1,700.00							1,700.00			
Totals	\$1,579,124.29	\$734,247.63	\$469,668.93	\$193,353.14	\$112,962.84	\$342,882.84	\$81,012.36	\$57,636.99	\$357,690.77	\$389,391.76	

*Lincoln Highway Association.

REPORT OF THE DEPARTMENT OF HIGHWAYS

Cont. No.	Fed. Aid Project No.	Contractor	Payments to contractors	Engineering 10% fund costs	Materials furnished by State	Construction carried on by State	Total cost payments to Nov. 30, 1920
1	1	Parrott & Thompson	\$11,971.60	\$1,417.31			\$13,388.91
2	3	Parrott & Thompson	6,646.13	6,635.62			7,051.75
3	3	Parrott & Thompson	12,294.15	1,719.43			14,013.58
4	8-A	Niedt & Gavin	27,221.37	2,401.96	\$3.12		29,623.96
5	8-B	Niedt & Gavin	6,648.71	1,970.30			7,619.01
6	9	Parrott & Thompson	44,448.72	5,033.16			49,481.88
7	9	Lincoln Construction Co.	51,936.05	10,233.82			62,169.87
8	10	John O'Keefe et al.	48,938.36	9,624.44		\$10,198.06	68,761.86
9	11	John O'Keefe et al.	17,911.20	8,410.98		27,458.80	53,781.96
10	16	William Lickling	27,931.14	2,165.68			30,096.82
11	16	William Lickling	49,143.30	5,113.62	4.00		54,260.92
12	12	Nebraska Construction Co.	72,035.60	10,942.12	110,344.01		193,321.73
13	9	Pacific States Construction Co.	29,333.39	3,680.45	21,085.00		54,100.84
14	13	Niedt & Gavin	27,913.24	3,305.25			31,218.49
15	14	Kibby & Gibson	14,324.68	4,043.12			18,367.80
16	18	Kibby & Gibson	41,333.68	6,252.84	33,091.64		80,688.12
17	16	W. J. Schmidt	54,393.05	6,252.84			60,645.89
18	24	H. J. Schmidt	43,709.24	4,084.57			47,793.81
19	17	Nebraska Southern Railway Co.	5,397.58	4,512.88			9,910.46
20	21	P. A. Quigg & Baker	98,394.54	5,989.71	22.20		104,406.45
21	1	A. Quigg & Baker	26,354.98	3,684.06			30,039.04
22	7	Nebraska Contracting Co.	70,407.84	7,082.55			77,490.39
23	23	Machine-shed building					
24	27	Virgin River bridge steel					
25	27	Can't contract.	14,210.98	311.06			14,522.04
26	19	J. H. Caughey	57,159.59	6,658.05			63,817.63
27	30	Pitt-Taylor Syndicate	18,115.91	2,701.13			20,817.04
28	7	Pacific States Construction Co.	46,092.30	5,000.25	55,594.03		106,686.61
29	29-A	Pitt-Taylor Syndicate	51,177.29	6,306.57	29,333.91		86,817.77
30	27	Midland Bridge Co.	1,185.92	1,815.83			3,001.75
31	9	Blahop & Griscom	8,300.58	1,845.70	2,397.23		12,543.51
32	9	J. Woods	4,407.33	1,943.47			6,350.80
33	7	Miner Valley Bridge and Iron Co.	7,415.19	1,755.57			9,170.76
34	22	John Row & Wells	14,541.37	2,057.18			16,598.55
35	12	Jenkins & Wells	3,271.20	2,642.48			5,913.68
36	25	Blahop & Griscom	32,681.16	2,875.79	28,805.68		63,962.63
37	29-B	W. J. Schmidt	7,803.18	1,033.45	2,375.45		10,212.08
38	29-B	John Row & Wells		2,989.51	508.23		3,497.74
39	14	Shepard & Weber.					
40	35	Section 8 Projects					
1-8	1-8	Tonopah Project	22,516.83				22,516.83
2-8	2-8	Austin-Eureka Project	31,000.00				31,000.00
3-8	3-8	Currant Creek Project	1,700.00				1,700.00
		Totals	\$1,114,240.09	\$136,457.32	\$230,867.93	\$41,558.35	\$1,523,124.29

SEGREGATION OF MAINTENANCE EXPENDITURES

County	Route No.	1919	1920	Grand total	Route No. 1	Route No. 2	Route No. 3	Route No. 4	Route No. 5
Churchill	1	\$1,203.68	\$1,863.67	\$3,067.35	\$3,067.35	\$3,174.49			\$9,730.28
Churchill	2	990.71	2,133.78	3,174.49					192.15
Clark	5	1,473.89	8,251.89	9,780.28					
Clark	5	4.47	187.68	192.15					
Douglas	3		2,684.87	2,684.87			\$2,684.87		
Elko	1	1,690.17		1,690.17					
Emeralda	3	3,560.20	935.93	4,496.13			4,496.13		
Eureka	1	639.69		639.69					
Eureka	2	351.49		351.49					
Humboldt	1	1,064.30		1,064.30		351.49			
Lander	2	132.91		132.91		132.91			
Lyon	1	2,440.45	919.74	3,360.19					
Lyon	2	90.18		90.18		90.18			
Lyon	3		2,034.63	2,034.63			2,034.63		
Nye	4	579.69	6,097.69	6,677.38				\$5,677.28	
Nye	6	3,233.65	13,402.52	16,636.17					16,636.17
Ormsby	3	1,076.68	1,533.75	2,610.43			2,610.43		
Perishing	1	3,852.94	1,592.25	5,445.19					
Wasatch	1	3,448.77	2,351.38	5,800.15					
Wasatch	3	3,438.97	1,890.83	5,329.80					
White Pine	2	516.17	1,260.00	1,776.17		765.17			
Totals		\$29,330.21	\$44,121.16	\$73,451.37	\$19,597.49	\$4,514.24	\$17,083.76	\$5,677.28	\$28,578.60

PLANT AND YARD OPERATIONS

Operation Items	Machine shop	General yard	Operation stockroom	Stock account debits					Equipment stock
				Tires	Gas and distillate	Oil and greases	Supplies	Parts	
1. Pro Rate of Overhead.....	\$1,130.69	\$259.58							
2. Machine-Shop Operation—									
A. Expendable tools.....	138.07								
B. Supplies.....	333.27								
C. General repairs.....	734.56								
D. Nonexpendable tools.....	258.78								
E. Repair fund charges.....	6,733.77								
F. Additional equipment.....	9,765.46								
G. Tire fund charges.....	516.73								\$4,827.02
3. Yard Operations—									
A. Material storage.....		237.07							
B. Direct labor and supplies.....		4,012.28							
4. Stock Operations—									
Tire stock purchased.....				\$3,542.73	\$968.08				
Gasoline and distillate.....							\$2,840.77		
Supplies.....						\$936.21		\$1,885.47	
Oil and greases.....								294.01	
Parts.....								111.80	
War material parts.....						57.37	163.30		
Operating prorated.....			\$804.49	205.95	57.07				
Operating totals.....	1,813,487.64	\$4,249.85		\$3,782.73	\$1,020.15	\$1,026.58	\$3,009.07	\$2,391.28	\$4,827.02

CONSTRUCTION AND PROFIT AND LOSS ACCOUNTS, BENO PLANT

Cost units	Construction units			Profit and loss accounts			
	Machine shop	Office and stock building	Yard and equipment storage sheds	Operating expenditures		Sales and revenues	
				Items	Amounts	Items	Amounts
A. Prorata of overhead		\$396.57	\$721.55	Machine-shop operations	\$18,487.64	Tire sales	\$3,202.23
1. Shop building construction	\$1,099.78			Yard operations	4,249.35	Gas and distillate sales	1,800.46
2. Machinery and placing	8,764.73			Tires	3,782.73	Oil and grease sales	419.18
3. Office stock building	8,781.26	3,875.67		Gas and distillate	1,020.16	Supplies sales	7,322.45
4. Gas and oil storage plants		2,243.67		Oils and greases	1,025.88	Parts sales	2,940.11
5. Machine shop floor	425.64			Supplies	3,009.07	Truck rentals	30,440.03
6. Storage shed No. 1			3,049.01	Parts	2,291.28		
7. Storage shed No. 2			4,776.79	Equipment stock	4,827.02		
8. General yard construction			4,012.28	Plant depreciation	1,282.55		
9. Office equipment		369.69		Gross expenses	\$39,946.37	Gross revenue	\$46,124.46
Total cost building and storage units			\$12,519.63	Inventory value of stock	5,716.60		
Office and stock building		\$6,886.60		Net operating expenses	\$34,229.77		
Machine shop unit	\$19,071.41			To balance	11,895.69		
Total plant costs			\$38,476.64		\$46,124.46	Net profit	\$11,896.69
Depreciation 6 months, at 15 year life			1,282.55				
Asset value of plant Nov. 30, 1920			\$37,194.09				

LAHONTAN PLANT OPERATION

Items of cost	Distribution		Grand total construction costs
	Plant construction	Spur-track construction	
Plans and designs	\$684.71		\$684.71
Supervision	803.96		803.96
Materials	20,619.97		20,619.97
Supplies	3,704.00		3,704.00
Labor costs—Direct	14,894.29	\$2,759.34	17,653.63
Indirect labor—Boarding-house	1,453.88		1,453.88
Equipment—Machinery	22,714.99		22,714.99
Grand total construction costs			\$67,635.16
Depreciation, five months' operation			14,065.50
Inventory value of plant			\$52,969.66

PLANT OUTPUT

Cont. No.	Location	County	Tonnage of output			Value charged to construction jobs
			Tons of gravel	Tons of sand	Total output	
12	Reno to Huffakers	Washoe	4,962.60	3,830.86	8,813.46	\$17,831.32
28	Huffakers to Washoe Summit	Washoe	5,319.46	4,236.25	9,555.70	19,341.31
29	Washoe Summit to Franktown	Washoe	1,470.95	2,005.70	3,476.65	7,085.52
31	Bridge, Evans Creek	Washoe	287.50	140.00	427.90	865.82
36	Minden-Gardnerville	Douglas	2,010.55	2,791.00	4,801.55	9,716.61
37	Franktown-Lakeview	Washoe	80.55	101.95	182.50	369.31
38	Franktown-Lakeview	Washoe	93.05	155.65	248.70	503.28
	Maintenance Washoe 3-B	Washoe	70.95		70.95	143.88
	Board of Prison Commissioners	Ormsby	104.00		104.00	211.27
	Stock piled at plant			10,000	10,000.00	
	Total plant output				37,681.81	
	Charged to construction jobs					\$56,018.24

LAHONTAN PLANT CONSTRUCTION

Operating items	Operation	Maintenance and boarding-house	Totals
Materials	\$1,784.57		\$1,784.57
Supplies	1,240.75		1,240.75
Fuel and oils	5,808.30		5,808.30
Labor costs—Direct	19,755.12		19,755.12
Miscellaneous	3,489.62		3,489.62
Supplies		\$2,861.97	2,861.91
General repairs		1,080.91	1,080.92
Labor costs—Direct		2,080.42	2,080.40
Truck operations		659.90	659.98
Boarding-house—Indirect		2,370.18	2,370.10
Spur-track maintenance		211.00	211.07
Totals	\$32,078.36	\$9,274.38	\$41,352.74
Total plant output			\$37,681.81
Loading cost per ton			\$1.097

TABLE SHOWING INCOME AND EXPENDITURES—COUNTY-STATE HIGHWAY FUNDS

County	Estimated Income			Total Income to Nov. 30, 1920	Disbursements to Nov. 30, 1920		Estimated additional income	
	1917	1918	1919		Paid out of fund to Nov. 30, 1920	Estimated balance in fund	Taxes, 1920	Total to June 30, 1921
Churchill	\$5,850.81	\$9,070.58	\$9,174.19	\$24,095.57	\$16,070.56	\$8,025.01	\$9,825.50	\$17,850.51
Bond sales			75,000.00					
Clark		8,324.43	8,175.65	91,500.08	4,613.83	86,886.25	8,765.51	95,651.76
Bond sales			14,746.44					
Douglas	2,129.59	3,457.53	3,581.21	23,919.12	23,919.12		4,072.72	4,072.72
Elko	25,102.58	40,791.48	41,112.61	107,006.65	21,183.59		44,762.22	130,535.23
Esmeralda	3,972.35	5,551.53	5,909.04	15,432.96	11,845.57		5,614.40	9,201.82
Eureka	4,222.86	6,623.07	6,394.84	17,245.77			7,065.68	24,311.45
To Pershing			26,500.25					
Humboldt	18,530.51	29,744.69	17,897.37	39,462.32		39,462.32	19,108.57	58,570.89
Lander	3,901.92	6,299.85	6,896.32	16,588.09		8,504.66	6,849.43	15,348.09
Special Fund			20,000.00					
Lyon	5,463.59	9,784.72	10,831.31	45,604.62	41,474.04	4,130.58	11,323.73	15,454.31
Bond sales			30,000.00					
Mineral	3,213.45	4,901.77	4,832.24	42,752.46	7,450.72	35,301.74	4,981.48	40,283.22
Nye	7,527.24	11,231.47	11,117.04	29,875.75	12,823.14	17,047.61	11,930.45	28,978.06
Ormsby	1,151.71	1,750.76	1,733.87	4,686.34	4,686.34		1,806.61	1,806.61
From Humboldt			26,500.25					
Pershing			12,098.31	38,998.56	38,998.56		13,923.81	13,923.81
Bond sales			32,064.91					
Washoe	19,689.05	32,505.57	32,629.61	116,690.14	116,690.14		35,835.07	35,835.07
White Pine	16,016.43	18,942.79	17,524.76	52,483.98	19,276.82	33,205.16	17,434.60	50,639.76
Totals	\$116,802.07	\$188,996.64	\$387,053.98	\$666,352.44	\$327,132.86	\$339,219.58	\$203,300.82	\$542,520.40

CHURCHILL COUNTY

In Churchill County the State Highway Department was faced with the knottiest road problem in the entire State, that of building a highway across such country as the Fallon Sink, Frenchman's Flat, and through sandy country such as that located between Fallon and Hazen. The Fallon Sink has always been known as the worst piece of road on the transcontinental highway between New York and San Francisco. Early in the existence of the department it was determined that, as soon as finances would permit, the Fallon Sink would be eliminated. The matter of finances in Churchill County was a very serious one right from the beginning, as the assessed valuation of the county was only slightly in excess of \$5,000,000 in 1917, meaning a maximum income to the county and state highway funds of \$16,000 per year.

Churchill County is crossed by two routes of the State Highway System—Route No. 1 along the Southern Pacific Railroad from near the old Salt Works to the north Churchill county-line near Miriam, and the other that portion of Route No. 2 from just west of Hazen to the east county-line beyond Eastgate, both routes including a mileage of approximately 140 miles. Route No. 2 is a section of the Lincoln Highway, being a part of the transcontinental highway between New York and San Francisco. This section of Route No. 2 in Churchill County probably presents more varied road-building problems than any stretch of equal length on the entire State Highway System. We cannot better express the highway situation in Churchill County than by quoting a short editorial comment from a recent issue of the Churchill County Standard, which states:

State highway authorities maintain that this county presents most vexatious road-building problems. A project that is entirely feasible of consummation elsewhere within Nevada assumes a most complex nature here because of climatic and soil conditions. Road-building materials are absent here, lack of congealing moisture spells the maximum of road wear and tear, and small tax values add to the general discomfiture of those entrusted with the job of providing suitable roads in this county that will handle the growing volume of traffic.

The soil of the territory in the immediate vicinity of Fallon is of a rich sandy loam with areas of drift sand of frequent occurrence, presenting a construction problem for any type other than concrete or similar permanent pavement. The cost of concrete being prohibitive, we had to resort to gravel or some type cheaper than cement. The use of gravel, however, is costly and after placing not entirely satisfactory because of the lack of moisture for binding and, in the case of work already done in Churchill County, the long and expensive haul for the gravel. The Fallon Sink is the sink or lake of final disappearance of the Carson River and is really an immense saline bed which has been carried down by the river and deposited between two mountain ranges. It is also the last vestige of old Lake Lahontan which geologists tell us in prehistoric times, together with Lake Bonneville, occupied the entire intermountain plateau now composing the State of Nevada and parts of Oregon and Utah. The soil of the Fallon Sink is peculiar unto itself, being of a light spongy nature. This soil has more or less successfully defied all attempts at road building during the past.

the freighters of the early days making it a practice when crossing the sink with empty wagons to load them up with boulders and dump them along their trail across the sink. As time went on this built up a sort of embankment with a beaten track which was passable until wet weather came along, and then woe unto him who in crossing was compelled to get out of the worn rut.

The city of Fallon is a thriving and rapidly growing community and is the hub of the Newlands Reclamation Project, and we felt that, because of the rapid development of this territory, Churchill County should have first consideration for road improvement. Accordingly the first year's program of the department, laid out in 1917, and consisting of eight projects, included an important one in Churchill County, being the section of road from Fallon to Leeteville, an eight-mile section of the Fallon-Hazen road, including two bridges, one of 85-foot span and the other of 120 feet. This project was followed by the Fallon Sink project at a later date, and since the submitting of these first two projects two others have been added to the program for Churchill County.

An important aid to us in the Churchill County work has been the financial assistance of the Lincoln Highway Association on the Fallon Sink project. This association early in 1918 received a donation of \$120,000 from prominent members of the automobile industry in the East to be offered to the State of Nevada for aid in improving the Lincoln Highway on certain specified sections across the State. A complete history of this aid is given in the chapter of this report dealing with this project.

The following is a brief review of the activities of the department in Churchill County together with a report of the status of the work on each project to date:

Fallon to Leeteville

This project, as originally laid out, contemplated the construction of a sand-clay type of road between the city limits of Fallon and Leeteville, including two bridges—one over the Carson River and the other over the Government Canal. The project statement was submitted to the Federal Government on October 24, 1917. The matter of location and the question of rights of way on this project were quite important ones, and after a very thorough reconnaissance this department was convinced that the proper location for the road should be parallel with and on the south side of the railroad, thus entirely eliminating two railroad crossings on this eight-mile section. This meant an entirely new location for a distance of approximately two miles, involving the acquisition of new rights of way. This department accordingly proceeded with the survey along the line of reconnaissance, and on completion of the survey took up with the Board of County Commissioners the matter of rights of way and costs. The County Commissioners agreed that the location as adopted was the proper one for the road, and also agreed to undertake the securing of the needed rights of way free of cost to the State within a reasonable time; and, without resorting to condemnation proceedings, all necessary rights of way were finally secured.

The project, as originally submitted in 1917 calling for a sand-clay surface 15 feet wide on a 21-foot roadbed with a 137-foot concrete-pile trestle over the Carson River and a 65-foot steel-skew truss over the

Truckee-Carson Canal, the total length of the project being 8 miles, was estimated to cost the sum of \$57,195.20.

Owing to the fact that the Government would share only 50% of the cost and to the further fact that the State will only provide an amount equal to 25% of the cost, it was necessary that additional funds be provided by the county. Accordingly, at a meeting with the Board of County Commissioners the county agreed to make provision for the raising of the additional sum of money, the apportionment of estimated costs then being as follows:

Federal Government—50%.....	\$28,597.00
State share—25%.....	14,298.80
Churchill County—County-State Highway Fund.....	5,838.39
Churchill County Special Fund.....	8,460.41

Total estimated cost, 1917.....	\$57,195.20
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After submitting the project statement to the Federal Government we carried on very extensive investigation of available deposits of clay and other types of surfacing material. After exhaustive tests of available clays, and after observing climatic conditions through the season of 1918, we decided that a sand-clay road would not be satisfactory on this section, both due to poor qualities of available clay and long dry summer seasons. Accordingly a new estimate was prepared and forwarded to the federal authorities, the type of surfacing being changed from sand-clay to a gravel surface 5 inches deep after compacting, 15 feet wide on a 21-foot roadbed, also making both bridges of the reinforced concrete type. The nearest available gravel of suitable quality was located at the Lahontan Dam, necessitating a railroad haul and loading of the gravel at the pits. On advertising for bids in 1918 we were unable to get even reasonable bids on the basis of the contractor loading and furnishing the gravel, so that finally the State decided to furnish the gravel to the contractor f. o. b. at the nearest railroad siding. Accordingly bids were asked for early in 1919 for doing the work on the roadway sections, the State to furnish the gravel for surfacing. The contract for this work was entered into with Baker & Armstrong in September, 1919.

The contracts for the two bridges were awarded to Messrs. Parrott & Thompson of Salt Lake City, Utah, in January, 1919.

Under the roadway contracts it was necessary for the State to construct a gravel-loading plant at Lahontan, also to negotiate with the United States Reclamation Service for the gravel from the Lahontan pits. The Reclamation Service was good enough to allow the use of the gravel without cost and also to assist us in every way possible in the loading operations at Lahontan. After letting the bridge and roadway contracts, the revised estimate of cost was submitted to the Federal Government, showing a total estimated cost of \$108,298.41, prorated as follows:

Federal Government.....	\$47,926.96
State share.....	30,185.73
Churchill County.....	30,185.72

A comparison of the above estimate with that of 1917 illustrates very graphically the increase in 1920 construction costs over those which prevailed in 1917.

The two bridge contracts were completed early in 1920, and the roadway contract was completed and the road opened to traffic in September of the present year.

Salt Wells to Sand Springs

This project covers the famous Fallon Sink, and presented the real road problem in Churchill County. Early in the existence of the department finances would not permit the improvement of this section; however, early in 1919 the Lincoln Highway Association came forward with an offer of financial assistance on certain sections of the Lincoln Highway across Nevada, chief among which was the Fallon Sink section from Grimes Ranch to Sand Springs, that association agreeing to pay on this particular project the sum of \$45,000, the balance of the cost to be met by the State and Federal Government. This gift of the association made it possible for the department to finance the Fallon Sink job, and we at once proceeded with the preparation of project statements and the making of surveys and plans for this project. The project statement covering the entire section between Grimes Ranch and Sand Springs, a distance of 17.3 miles, was submitted to the Federal Government on September 26, 1919. The improvement contemplated by the statement would consist of a gravel roadway of 20 feet, top width, a surface of gravel or crushed rock 12 feet wide, with 18-foot turnouts every 2,000 feet, the minimum height of fill to be 3 feet above the sink level, and with drainage structures of permanent concrete. When submitting this project statement it was very difficult to estimate the cost of doing the work, and therefore the estimates submitted were made sufficiently high to meet all contingencies. This estimate as included was therefore \$220,440, to be borne by the Federal Government, the Lincoln Highway Association, and the State. During the season of 1919 we advertised for bids for the grading and structures on the section between Salt Wells and Sand Springs, a distance of 10 miles, and were successful in awarding the contract for this work on October 22, 1919, to W. J. Schmidt of Berkeley, Calif. Work began under this contract in April, 1920, and the contract was completed during September of the same year. Under this contract a fill approximately $3\frac{1}{2}$ feet higher than the level of the surrounding flats was thrown up for the entire ten miles, with a minimum width of 20 feet, 18-foot turnouts every 2,000 feet, and with the highest type of reinforced concrete box culverts. This grade is now ready for surfacing, which will be done under separate contract during the year 1921. The total estimated cost of the contract complete, together with its apportionment to the various participants, is as follows:

Federal Government.....	\$37,372.50
Lincoln Highway Association.....	26,876.25
State share.....	10,496.25
Total cost.....	\$74,745.00

The balance of the gift of the Lincoln Highway Association will be used in completing the project between Grimes Ranch and Sand Springs, consisting of the surfacing of the grade thrown up under the Schmidt contract, and the grading and structures, with graveling, of the balance of the project between Salt Wells and Grimes Ranch.

Leeteville to Hazen

A project statement covering the section of Route No. 2 between Leeteville and Hazen was submitted to the Federal Government on May 6, 1920, providing for a gravel road 8.27 miles in length, 15 feet

wide on a 21-foot roadbed, together with a 50-foot reinforced concrete bridge over the "L" line canal of the United States Reclamation Service. The estimated cost of this section, together with the apportionment to the various participants, is as follows:

Federal Government.....	\$60,574.40
State share.....	30,287.20
Churchill County.....	30,287.21
Total cost.....	<u>\$121,148.81</u>

This project, together with Federal Aid Project No. 3, Fallon to Leeteville, will give an improved highway for the entire distance of 17 miles between Fallon and Hazen. It is our expectation to get this latter project under way during the season of 1921 providing the county is able to finance its share of the cost.

Fallon to a Point Six Miles South

The Highway Department, in cooperation with the Board of County Commissioners, has had under consideration the pavement of approximately six miles of highway in a southeasterly direction out of Fallon on State Highway Route No. 2. Inasmuch as the matter of finances has not been finally disposed of, it may be said that this project is only in the preliminary stage and may or may not be taken up during the season of 1921. No surveys other than reconnaissance have been made of this project.

Frenchman's Flat

The Lincoln Highway Association has made available to this department for aid in improving Frenchman's Flat the sum of \$10,000, the project to include the section from the west side of the valley to the Fairview road fork. It is a condition of this gift that the project be placed under way and completed during 1921, and it is the intention of the department that it be so completed. The improvement will consist of a graveled road 10 feet wide, 5 inches thick on a 20-foot graded roadway, with 18-foot turnouts every 2,000 feet. The surveys for this project have been completed, the plans are practically complete, and it is our expectation to get the work under way early in the coming year. Project statement covering this project has not yet been submitted to the Federal Government.

Eastgate to Westgate

This is the third project in Churchill County designated for financial aid by the Lincoln Highway Association, the gift of the association on this project being \$7,500. Conditions are that the roadbed width shall be 18 feet, gravel surfaced 9 feet wide and 5 inches in depth, and the approximate length of the project is 15 miles. This project is on the program for the year 1921, and it will doubtless be completed during that year. The project statement covering the project has not been submitted to the Federal Government, neither has the location survey been made.

Survey and Reconnaissance of State Highway Locations

The location of practically the entire system in Churchill County is now determined with the exception of the first section immediately southeast of Fallon and between Eastgate and the east county-line. On this latter section the routing has not been finally determined. On the section between Eastgate and Austin in Lander County the



Reinforced Concrete Girder Bridge over Truckee-Carson Canal near Fallon—85-foot span. Built under Contract 2, Project 3.



Prepared subgrade ready for receiving gravel surface on Fallon-Leesteville Highway. Built under Contract 16, Project 3.

Lincoln Highway Association are offering an additional \$42,000 to assist in construction. This money will be made available to this department in the same manner as previous gifts as soon as it is definitely decided as to the routing of the highway between the two before-mentioned points. The decision as to the routing has been left to this department, and it is expected that final action on same will be taken in the near future, and portions of the section included in the 1921 program of construction.

Finances

The problem of finances in Churchill County may almost be compared to the construction problems because of the fact that the property valuation is comparatively low, providing only limited income from taxation. The gift of the Lincoln Highway Association, \$63,000 of which is designated for expenditure in Churchill County, has been of wonderful aid in putting over and planning a campaign of real construction in the county, and the citizens of the county should duly appreciate this fact. The problem of providing sufficient funds in the county, to take full advantage of the gift of the association and that the county may receive its full measure of federal aid, is quite serious, and merits immediate and earnest consideration by every citizen of Churchill County.

The following summary gives briefly the income and expenditure of the State Highway Department in Churchill County from the date of organization of the department to the present time:

Tax year	Valuation	REVENUE		
		Levy	State Highway Fund	County-State Highway Fund
1917.....	\$8,358,302.72	7 cents	\$5,850.81	\$5,850.81
1918.....	9,070,576.52	10 cents	9,070.57	9,070.57
1919.....	9,174,185.47	10 cents	9,174.18	9,174.18
			\$24,095.56	\$24,095.56
Special tax levy.....				8,460.41
				\$32,555.97
Authorized county bond issue.....				\$100,000.00

EXPENDITURES				
Calendar year	Surveys and plans	Maintenance	Construction	Total
1918.....	\$1,652.09	\$3,541.59		\$5,193.68
1919.....	1,642.75	2,104.40	\$46,261.81	50,008.96
1920.....	6,245.82	4,047.45	116,389.27	126,682.54
Total expenditures in Churchill County.....				\$181,975.18

Although the Legislature of 1919 authorized a county bond issue of \$100,000 to aid in the construction of the State Highway System, none of these bonds have as yet been issued. In order to carry through the 1921 program in the county, however, it will probably be necessary to issue some of these bonds.

Surplus War Equipment Delivered to Churchill County

Under the Act of Congress apportioning surplus war material to the state highway departments of the various States, there has been given to Churchill County and the city of Fallon for road and street improvement the following equipment:

No.	Equipment	Dept. No.	Market value	Cost to County	Cost to Fallon
1.....	Nash Quad 2½-ton truck.....	118	\$4,200	\$266.39	
1.....	Nash Quad 2½-ton truck.....	155	4,200	266.39	
1.....	Packard 2½-ton truck.....	211	2,000		\$325
3.....	Totals.....		\$10,400	\$532.78	\$325

In addition to the gift of the above equipment to the citizens of Churchill County at a cost of less than 10% of its market value, the department has also purchased for the county at less than market price supplemental equipment, such as hoists and dump bodies for the above trucks. Through purchase in carload lots and allotment to counties at actual cost, a very material saving was thus effected in this equipment. Churchill County is also entitled to receive its just proportion of the additional equipment which this department will doubtless receive from the War Department from time to time.

CLARK COUNTY

Clark County was left out of the State Highway System as originally designated by the State Highway Act of 1917; however, at the 1919 session of the State Legislature the Act was amended to extend the highway system into Clark County, the amendment designating the extension as Route No. 5, from Goldfield through Beatty, Indian Springs, Las Vegas, and on to the county-line; and Route No. 6 extending across the southern end of the State entirely within Clark County and following what is locally known as the Arrowhead Trail. This amendment was passed in order that the State might immediately take advantage of the L. V. & T. grade then being abandoned by the railroad company, and that the State could negotiate for the purchase of the bridges and structures before any of them were dismantled and torn up. Accordingly, immediately on the passage of the amended Act this department opened negotiations with the railway company for the purchase of the structures and improvements on the entire 110 miles of grade, and within a short time completed a deal for their purchase, the State paying to the railroad company \$3,889.44, which was paid jointly in equal proportions by the State and Clark and Nye Counties. This grade did not actually come into our possession until March, 1919, and the department at once proceeded with the tearing up of the ties and the scarifying and widening of the grade. Owing to the extremely hot weather in the summer months, the work was discontinued after about two months operations to be taken up again in the fall of 1919. After the work was again taken up it was carried to completion. The work consisted of throwing aside the ties, scarifying the grade to a depth of a few inches below the bottom of the tie marks, blading the grade for an equal depth, and throwing the material to the side, giving a grade surface width of 16 to 18 feet, also of the flooring with ties of all the bridges to a total width of 14 feet with guard-rail on each side. The work done to date on the grade gives probably the best 110 consecutive miles of good road in the State, even in its present condition; however, it is the purpose shortly to begin the surfacing with gravel of the sandy and bad stretches of the grade. Because of its being a railroad grade, the location follows beautiful curves, and the maximum gradient is $1\frac{1}{2}\%$, thus giving an extremely fast road for the entire distance.

In October, 1919, the department opened a division office in Las Vegas, placing a division engineer in charge with the purpose of making surveys for future construction on Routes 5 and 6 and in order to avoid the delayed mail service between Carson City and Las Vegas. The surveys were commenced at once, together with the completing of the work on the L. V. & T. grade, both in charge of the division engineer.

Briefly summarized, the following gives the status of the work in Clark County at this time:

Virgin River Bridge at Bunkerville

The first new construction begun in Clark County by this department was the construction of a steel bridge over the Virgin River between Bunkerville and Mesquite on Route No. 6. The crossing of the Virgin River at this point has long been the bugbear of the County Commissioners of Clark County and of the road boosters of the entire southern country. The river at this point is approximately a thousand feet wide consisting of a quicksand bed for the entire width, with the small stream of the river meandering around the bed, first in one place and then in another, presenting an ever-present and unlocated danger in the form of quicksand for the travelers compelled to ford the stream. We are advised that for past years the county has maintained a man and team at this crossing to tow automobiles across, involving a considerable monthly expense for this service.

On November 1, 1919, this department submitted a project statement to the Federal Government covering the construction of a bridge over the river at this point, the structure to consist of two 126-foot steel spans with 495 feet of timber trestle, together with the necessary weir control for the stream, the apportioned cost of the same to the participants being as follows:

Federal Government.....	\$37,427.50
State share.....	18,713.75
Clark County.....	18,713.75
Total estimated cost.....	\$74,855.00

On March 22, 1920, a contract was awarded to the Missouri Valley Bridge and Iron Company of Leavenworth, Kans., for the furnishing of the steel for this structure, and on May 17, 1920, the contract for the construction was awarded to the Midland Bridge Company of Salt Lake City, Utah. Actual construction began on the arrival of the steel in August, 1920, and has progressed satisfactorily since that time. It is expected that the bridge will be completed by April, 1921.

Muddy River Bridge

On July 12, 1920, a project statement was submitted to the Federal Government covering the construction of a new bridge over the Muddy River just east of the town of St. Thomas on Route No. 6, the bridge to consist of a timber-truss type approximately 116 feet in length, and estimated to cost \$7,491, prorated as follows:

Federal Government.....	\$3,745.50
Clark County.....	1,872.75
State share.....	1,872.75

This structure will replace a small wooden structure built by the county which is becoming unsafe because of the caving due to erosion of the stream banks. Advertisements calling for bids for the construction of this bridge are now being run, and the contract will doubtless be awarded by the close of the present year.

Las Vegas-St. Thomas Road

On October 18, 1920, the department submitted a project statement to the Federal Government covering the improvement of that portion of the St. Thomas-Las Vegas road from a point 16.79 miles southwest of St. Thomas to a point 30.10 miles southwest of St. Thomas, a total length of 13.31 miles, the improvement to consist of a graveled road 18 feet wide with permanent drainage structures of corrugated-metal pipe and reinforced concrete. The estimated cost of this project, together with the apportionment of costs, is as follows:

Federal Government.....	\$40,294.87
Clark County.....	25,294.87
State share.....	15,000.00
Total estimated cost.....	\$80,589.74

The surveys for this project are practically complete and the plans are now under way. Bids were called for on this project in November, 1920, but only one bid was received, which was too high, and was rejected. Bids will again be called for in the near future, and it is hoped to have this project under construction in January, 1921. It is also probable that, early in 1921, construction will be begun on an additional ten miles of the Las Vegas-St. Thomas road, the surveys for which are completed.

L. V. & T. Grade Work

As previously stated, on the L. V. & T. grade the ties have been removed, the entire grade has been scarified and widened, and the bridges have been floored. While even now the grade is in excellent condition for probably 85% of its length, there are a few stretches where either sand or soil conditions are bad, notably the flat just south of Indian Springs. Plans are now under way looking toward the surfacing with gravel of all portions of this grade which are now in bad condition both in Clark and Nye Counties. This, when completed, will give an excellent highway from Beatty to Las Vegas, making an important link of the north and south highway. This improved road will also doubtless be an incentive to some enterprising person or firm to begin the operation of a stage-line carrying the United States mail over this route, meaning much faster mail service between Las Vegas and Reno as compared to the present roundabout rail haul by way of Salt Lake City or Los Angeles. The improvement yet to be carried out on this grade will be done by force account by this department, as this will obviate the necessity of making surveys for preparation of plans in order to receive federal aid, the Government having agreed to accept the railroad company's plats in lieu of such surveys. This would not be possible were the work to be contracted, because of the peculiar federal aid regulations which permit the Government to pay 50% of actual cost in force-account work as the work progresses, but only 50% of the estimate in contract work, which may be less than the actual contract price.

Surveys and Reconnaissance of State Highways

Other than the surveys and reconnaissance completed between Las Vegas and Bunkerville on Route No. 6, a considerable amount of reconnaissance work has been done as to the routing of Routes 5 and 6 south from Las Vegas to connections with the state highway systems of Arizona and California. These connections have not as yet been definitely determined, although the reconnaissance surveys made have given the department much valuable information as to the possibility of the various routings.

Finances

Due to the fact that Clark County did not come under the State Highway System until early in 1919, the income from the county to the department has not been as large as that in other counties of equal tax valuation.

The following table shows briefly the department's income and expenditures in Clark County from January 1, 1919, to date:

REVENUE				
<i>Tax year</i>	<i>Valuation</i>	<i>Levy</i>	<i>State Highway Fund</i>	<i>County-State Highway Fund</i>
1919.....	\$9,174.185.47	10 cents	\$9,174.18	\$9,174.18
Authorized county bond issue.....				75,000.00
				\$84,174.18
EXPENDITURES				
<i>Calendar year</i>	<i>Surveys and plans</i>	<i>Maintenance</i>	<i>Construction</i>	<i>Total</i>
1919.....	\$5,612.46	\$1,482.86	.....	\$7,095.32
1920.....	11,900.27	8,439.57	\$17,523.74	37,863.58
				\$44,958.90

The issue of \$75,000 in bonds, as authorized by the 1919 Legislature for the purpose of aiding in the improvement of the State Highway System in Clark County, has been sold and the amount realized placed to the credit of the County-State Highway Fund.

Surplus War Material Delivered to Clark County

Under the Act of Congress apportioning surplus war material to the various state highway departments, there has been given to Clark County and the city of Las Vegas for road and street improvement the following equipment:

<i>No.</i>	<i>Equipment</i>	<i>Dept. No.</i>	<i>Market value</i>	<i>Cost to County</i>	<i>Cost to Las Vegas</i>
1.....	2½-ton Nash Quad truck.....	90	\$1,800	\$271.85	.....
1.....	2½-ton Nash Quad truck.....	97	1,800	271.85	.....
1.....	2½-ton Nash Quad truck.....	100	1,800	.....	\$364
3.....	Totals.....		\$5,400	\$543.70	\$364

In addition to the above equipment the county will be given its proportion of such other equipment adapted to its needs which will doubtless be received from time to time.



Type of wooden trestles on the L. V. & T. grade. These bridges were all taken over by the department and widened to 14 feet by placing ties end to end and close together. As completed the bridges are excellent structures and saved the State many thousands of dollars.



Widening the L. V. & T. grade in Clark County with 90-hp. caterpillar and heavy scarifiers and drags.

DOUGLAS COUNTY

Douglas County contains practically the entire area of what is known as the Carson Valley and is a large agricultural community. Two separate portions of one state highway route are located in Douglas County—one being the road between Carson City and Yerington leading by way of Minden and Gardnerville; and the other a short section between the Ormsby county-line and the California line on the south shores of Lake Tahoe. No attempt has been made by the department to do construction work on the portion of Route 3 reaching to Lake Tahoe, such work as has been done being confined exclusively to maintenance during the summer months. Very careful thought, however, has been given to the matter of improvement of the balance of Route 3 through Douglas County. This route traverses the almost exact center of the valley, connecting Minden and Gardnerville with the State Capital (Carson City) and continuing on over the Mountain House Summit as a part of the road to Smith and Mason Valleys and to the counties of



The concrete highway through the town of Gardnerville—20 feet wide with 12-foot shoulders. Built under Contract 36, Project 28. Connects the towns of Gardnerville and Minden.

Mono and Alpine in California. This is one of the most important sections of road in the State from the standpoint of producing territory.

Early in the existence of the department a project was outlined for Douglas County, which has been followed by other projects during succeeding years. Briefly outlined, the following is a record of the status of each separate project in Douglas County as of the present date:

Carters to Holbrook

This project covers a section of about four miles, consisting of what is known as the Mountain House Summit. It is intended to improve a section of road which has always given great difficulty in the way of maintenance, and which has at times become impassable during the winter months. A project statement on this section was submitted to

the Federal Government on November 8, 1917, calling for a graveled road 9 feet in width on a 15-foot graded roadbed. The estimate of cost as originally submitted and its apportionment to Government, county, and State was as follows:

Federal Government.....	\$5,615.06
Douglas County.....	2,130.24
State share.....	3,484.82

This project was covered by agreement with the Federal Government, but to date construction work has not begun. We called for bids on this project about two months ago, but no satisfactory bids were received. Surveys and plans are complete.

Minden to a Point $3\frac{1}{2}$ Miles North

Project statement covering this section was submitted to the Government on November 15, 1918, the primary object being to improve the bad section of the present road and to open a new road through the Dangberg field for a distance of $1\frac{1}{4}$ miles, shortening the distance between Carson City and Minden by possibly one mile. The improvement consists of a 15-foot graveled road on a 24-foot roadbed, with permanent structures of reinforced concrete. The contract for this work was let to John O'Keefe on September 9, 1919, and by him sublet to the firm of Kibby & Gibson. Construction work began immediately and is being carried on at the present date. Progress of the contractor had been very unsatisfactory and finally reached the point where in August of the present year a settlement was made with the contractors and the work taken over by the State, the contractors being released from the completion of the graveling of the portion of the contract located through the Dangberg field. Recently the department awarded a contract to Mr. John Ross for the completion of the surfacing work on this section, which is now going forward. The total cost, with apportionment to participants, is as follows:

Federal Government.....	\$22,025.00
Douglas County.....	11,012.50
State share.....	11,012.50
Total cost.....	\$44,050.00

Minden to Gardnerville

This project was submitted to the Federal Government on March 20, 1920, and called for the construction of a concrete pavement between the north city limits of Minden and the south city limits of Gardnerville, a distance of approximately 1.8 miles; pavement to be 6 inches thick and 20 feet wide on a 30-foot roadbed. The contract for this work was let to the firm of Bishop & Griscom on July 26, 1920, and construction work began immediately. The contract was completed and the road thrown open to traffic on December 1, 1920. This section of roadway is one of the finest pieces of pavement that has been built in the State, and the construction was made in record time, despite the fact that great difficulty was experienced in securing sufficient railroad cars to make prompt delivery of materials. This improvement was taken up at the request of the County Commissioners of Douglas County and various citizens of the county. It gives the towns of Minden and Gardnerville an improved main street, and serves to more closely connect the

CONSTRUCTION OF THESE TWO LOCALITIES. The total cost of this project as estimated by the Department is as follows:

Estimated cost of construction	\$36,000.00
Estimated cost of right of way	41,996.47
State share	8,666.27
Total cost	\$86,662.74

Bridges Over the Carson River near Cradlebaugh

A proposed project is now being prepared for the improvement of approximately 2 1/2 miles in the vicinity of Cradlebaugh Bridge. This will mean a new location from the present curve towards Cradlebaugh Bridge straight through to the new road built by Douglas County two years ago and will give a tangent from the first turn to the north of Cradlebaugh to the Stewart Indian School near Carson City. The project will include the construction of two reinforced concrete bridges over the Carson River, together with grading and graveling of about 2 1/2 miles of road. No estimates are at present available, but it is expected that this project will be taken up early in 1921.

Survey and Reconnaissance of State Highway Locations

Route 3 through Douglas County has been surveyed in its entirety, except a short section on the shores of Lake Tahoe, and plans have been prepared covering the major portion of such surveys. Any further improvements taken up in subsequent years, therefore, will mean that there will be no necessity of further location surveys.

Finances

The finances of Douglas County from a taxation standpoint are very limited, the total valuation of the county being small as compared with some of the other counties. To aid the department in carrying on the construction of the State Highway System, and to aid the County Commissioners in their road-building work, the last session of the Legislature passed a bill authorizing the Board of County Commissioners of Douglas County to issue bonds in the amount of \$150,000. It is from this bond issue that the county is paying a major portion of its share of the cost of the work now under way and completed.

The following is a brief summary of the revenue and expenditures of the department in Douglas County since organization in 1917:

Tax year	Valuation	REVENUE		County-State Highway Fund
		L Levy	State Highway Fund	
1917.....	\$3,042,275.00	7 cents	\$2,129.59	\$2,129.59
1918.....	3,467,877.00	10 cents	3,467.87	3,467.87
1919.....	3,581,214.00	10 cents	3,581.21	3,581.21
			\$9,178.67	\$9,178.67
Authorized county bond issue.....				\$150,000.00
EXPENDITURES				
Calendar year	Surveys and plans	Maintenance	Construction	Total
1917-1918.....	\$1,248.69			\$1,248.69
1919.....	2,312.31		\$7,559.80	9,872.11
1920.....	4,056.40	\$2,584.87	82,294.85	88,936.12
Total expenditures in Douglas County.....				\$90,056.92

Surplus War Equipment Delivered to Douglas County

Under the Act of Congress apportioning surplus war material to the various States there has been allotted to Douglas County the following:

No.	Equipment	Dept. No.	Market Value	Cost to
				Douglas County
1.....	2½-ton Nash Quad truck.....	148	\$4,200.00	\$266.39
1.....	2½-ton Nash Quad truck.....	130	4,200.00	266.39
1.....	1½-ton Kelly-Springfield truck....	183	1,800.00	225.00
1.....	2-ton Nash Quad truck.....	84	1,800.00	364.00
4....Totals			\$12,000.00	\$1,121.78

The Highway Department has also purchased for Douglas County dump bodies and hoists for the above trucks, which were purchased considerably under market prices, and this saving was effected by the county. It is probable also that additional equipment will be given to the county as it becomes available from the Government.

ELKO COUNTY

Elko County is the richest county in the State—in fact, it is an empire in itself, equaling in area some of the populous eastern States. This county is the seat of the ranching and stock-raising industry of the State, and the general topography is such as to make open-range conditions ideal for this industry.

Only one route of the State Highway System crosses Elko County, being Route No. 1 along the main line of the Southern Pacific Railroad, extending from the west county-line near Carlin to the Utah state-line near Montello, with a total mileage of approximately 135 miles. This location follows the valley of the Humboldt River between Carlin and the north limits of Starr Valley, and along the course of this river soil conditions are such as to require considerable careful investigation covering drainage, locations, and the availability of suitable surfacing material. The question of suitable gravel for surfacing in this county is quite a serious one, as the investigations conducted by this department to date indicate very limited quantities of suitable material located within reasonable hauling distance of the state highway. Freight rates on cement and other road-building materials from outside sources into Elko County are so high as to make almost prohibitive the cost of concrete or other type of permanent pavement, so that to date this department has not given serious consideration to types of construction other than gravel, shale, or crushed rock, or such types as will make use of local materials.

The location of the State Highway System through Elko County wherever possible follows and makes use of the old abandoned Southern Pacific grade, the use of which means a very material saving in the cost of excavation. The use of this grade, however, in many cases involved with the Southern Pacific Company the question of rights of way lying within the old railroad right-of-way grant 400 feet in width. Because of the necessity in some cases of paralleling the railroad through narrow canyons, it was imperative that we make use of this abandoned railroad grade, and it meant a long series of negotiations with the railroad company for the right of way, even to the extent of filing condemnation suits, which were afterwards compromised.

At the very beginning of the existence of the State Highway Department it was realized that, because of its location and wealth, Elko

County was entitled to first consideration in state highway construction. Therefore, early in 1917 there was submitted to the federal authorities, a project statement covering the road from Elko to Carlin, it being the intention to get this section under construction the following year. Under war conditions, however, construction was not gotten under way until April, 1919. The above statement was followed in 1918 with one covering the section from Carlin north to the county-line at Maggie Creek, and later by a third project statement covering the section between Elko and Halleck.

The following is a brief review of each project in the county, together with the status of the work at this time:

Elko to Vivian

Surveys were completed and project statement was submitted to the Federal Government in the year 1917. Plans were gotten out early in 1918 and advertisements, asking for bids on construction, were inserted in local papers and coast trade journals. At about the same time the War Industries Board took control of all construction in the United States, and under their orders we were not allowed to proceed with any new construction, and construction under way was limited to actual necessity. This prevented any construction work other than maintenance in Elko County during 1918. Early in 1919 bids on this section were again asked for, and on April 19 the contract was awarded to J. H. Rooney and associates of Santa Monica, Calif., the estimate of cost being as follows:

<i>Cost</i>		<i>Prorated</i>	
Contract price.....	\$106,112.48	Federal Government—50%...	\$57,513.81
Engineering, construction, 10%	8,915.14	Elko County—25%.....	28,756.91
		State—25%.....	28,756.90
	<u>\$115,027.62</u>		

Construction began immediately and progressed fairly well for a few months, the contractor, even during this period, however, not making progress satisfactory to this department. During this first season work to the approximate value of \$49,000 was handled, the contractor, on account of bad weather, being forced to close down operations about November 30. Operations were again resumed in May, 1920, on a very small scale and dragged along in a haphazard manner until late in the summer, at which time the department came to the conclusion that some drastic action would have to be taken to secure better progress. Accordingly, during July the contractors were notified to meet with the directors at Carson City and at that time an agreement was reached for the employment of competent superintendents and, as we thought, provision made for better progress. Even under this arrangement, however, progress was still slow, so that finally, on September 30, the Board of Directors and the Highway Engineer made an inspection of the work and were so dissatisfied with the general aspect that the department took over the operation of the contract and placed the resident engineer in charge of construction. At the closing down of operations on November 20 the condition of the job was as follows:

Excavation, 90% complete, only finishing and shoulder work left.
Gravel surface, 6 miles, 30% complete.

This means that the job should be completed early in the coming season.

Elko to Halleck

This project covers the important road leading from Elko to the North Fork country and on to Halleck and to the entire eastern portion of Elko County. It is one of the most important roads in Elko County, and one greatly in need of improvement over a great portion of its length. The survey covering this section was made during the fall and winter of 1919, and the plans were begun early in the present year. A revised project statement was submitted to the Federal Government in June, 1920, covering the entire twenty miles, a



The Moleen Hill on State Highway under construction in Elko County.

statement having been previously submitted in 1918 covering only the portion from Elko to North Fork road. Under the amended statement the total cost of the project is estimated as follows:

<i>Cost</i>	<i>Prorated</i>
Construction.....\$194,600.00	Federal Government—50%.....\$107,030.00
Engineering and construction. 19,460.00	Elko County—25%..... 53,515.00
	State—25%..... 53,515.00
\$214,060.00	

On this and the following project the matter of roadway width as between the width thought advisable by this department and the width desired by the federal authorities was the one factor that prevented the letting of contracts covering these two projects during the season

of 1920. In this matter of roadway width this department is opposed to the construction of a roadway greater than 21 feet in width on outlying projects which carry traffic comparable with these Elko projects. The Bureau of Public Roads, however, has been almost insistent for a minimum roadway width of 24 feet. This department takes the attitude that a 21-foot roadbed, which provides a 15-foot surface with 3-foot shoulders on each side, is ample for all traffic needs both now and in the future on 95% of the State Highway System. Furthermore, the item of additional cost for the additional 3-foot width is a very serious one, and in many cases would prohibit the construction of contemplated projects because of lack of finances, or, if proceeded with, would so reduce the length of the project as to seriously reduce the benefit to the territory adjacent to the project. The question of this roadway width was first raised by the Bureau of Public Roads in April, 1920, in the case of plans for a project in Pershing County, and a flat refusal was made by the bureau to approve the plans on this and similar projects when a roadway width of 21 feet was provided. This effectively stopped further progress on all similar projects until this question of roadway width was threshed out with federal authorities.

We immediately carried the matter to the Chief of the Bureau, and, after several months, or in September, 1920, succeeded in convincing the bureau that a flat ruling of a minimum roadway width was not applicable to Nevada, and that some of our projects had been approved with a lesser width. A complete review of our negotiations with the federal authorities appears in the section of this report devoted to federal aid.

Although we were partially successful in our fight on the minimum roadway width, it was so late in the season that we decided it would not be advisable to proceed with the letting of contracts on the two remaining projects, as the winter season would set in almost before the work could be commenced. It was, therefore, decided not to attempt to let a contract covering this section until early in 1921. Accordingly, just recently an advertisement was published in local and state papers advising interested bidders that bids would be called for on this job early in January, 1921, and requesting them to view same at this time in preparation for bidding in January. This means that this project should be commenced by March of the coming year. This will be a gravel-surfaced road with permanent concrete drainage structures.

Vivian to West Elko County-Line

This project is an extension of the Elko-Vivian project and will carry the construction from the city of Elko to the western limits of the county. The mileage of this project, as covered by project statement submitted in 1918 is 8.1, estimated to cost as follows:

Cost		Prorated	
Construction.....	\$47,024.50	Federal Government—50%.....	\$23,512.25
Engineering and construction.	4,702.45	Elko County—25%.....	12,931.74
		State—25%.....	12,931.74
	<u>\$51,726.95</u>		

It is expected that this project will be contracted for construction early in the coming season. It was not advertised for bids during the past season because of the same reasons as applied to the Elko-Halleck project. All surveys and plans have been completed on this project.

Surveys and Reconnaissance of State Highway Location

From Wells to the Utah state-line there are several possibilities as to state highway routing. The State Highway Act provides that Route No. 1 shall follow a general course through the towns of Montello, Cobre, Wells, Deeth, etc. Considerable thought has been given to the possibility of locating on some direct line from near Wells to Wendover, this location being urged by many residents of Elko County. In furtherance of this, the department just recently had a thorough reconnaissance made of the two routes from Wells to the Utah line by a competent engineer. The Wendover route has been urged by the state highway authorities of Utah on account of the work done by them on the Wendover cut-off and because it would afford a direct connection with Salt Lake City to the south of Great Salt Lake.

Between the towns of Deeth and Wells there also came up a question of location—whether to follow the old abandoned Southern Pacific grade or the present road location through Starr Valley. During September, however, and after thorough investigation of the merits of the two locations, the Board of Directors definitely adopted the Starr Valley location as the route of the state highway between Deeth and Wells.

Finances

Elko County is the wealthiest county in the State, the revenue to the State and County-State Highway Funds being larger than the revenue of any other county. Expenditures of the department in Elko County have not been as extensive as in many of the counties, because we were prevented from getting additional contracts under way during the construction season of 1920 on account of the refusal of the Bureau of Public Roads to approve a roadway width of 21 feet as herein previously outlined. We feel, however, that this will mean a much larger work during the season of 1921, as it is the sincere belief of this department that contracting conditions will be much more favorable through better labor conditions and lower material costs, thus meaning quite a saving in construction costs over those prevailing during the season of 1920.

The following tabulation sets forth briefly the department income and expenditures in Elko County from the time of organization to date:

REVENUE				
<i>Tax year</i>	<i>Valuation</i>	<i>Levy</i>	<i>State Highway Fund</i>	<i>County-State Highway Fund</i>
1917.....	\$35,860,805.00	7 cents	\$27,102.56	\$27,102.56
1918.....	40,791,486.00	10 cents	40,791.48	40,791.48
1919.....	41,112,609.00	10 cents	41,112.60	41,112.60
			<u>\$109,006.64</u>	<u>\$109,006.64</u>
EXPENDITURES				
<i>Calendar year</i>	<i>Surveys and plans</i>	<i>Maintenance</i>	<i>Construction</i>	<i>Total</i>
1917.....	\$1,919.41	.....	.....	\$1,919.41
1918.....	2,106.63	\$183.95	.....	2,290.58
1919.....	1,585.82	1,690.17	\$45,254.98	48,530.97
1920.....	4,002.47	.....	23,536.38	27,628.85
Total expenditures in Elko County.....				<u>\$80,369.81</u>

Surplus War Material Delivered to Elko County

Under the Act of Congress apportioning surplus war materials to the state highway departments there has been given to the county of Elko and the city of Elko for road and street improvements the following-described equipment:

No.	Equipment	Dept. No.	Mkt. value	Cost to County	Cost to City of Elko
1.....	Heavy Aviation 3½-ton truck.....	102	\$3,600	\$308.25	
1.....	Heavy Aviation 3½-ton truck.....	103	3,600	308.25	
1.....	Nash Quad 2-ton truck.....	135	3,600	266.39	
1.....	Nash Quad 2-ton truck.....	149	3,600	266.39	
1.....	Heavy Aviation 3½-ton truck.....	107	3,600	298.20	
1.....	Heavy Aviation 3½-ton truck.....	110	3,600	298.20	
1.....	Peerless 3½-ton truck.....	68	3,000	544.45	
1.....	Heavy Aviation 3½-ton truck.....	108	3,600	328.20	
1.....	Heavy Aviation 3½-ton truck.....	109	3,600	328.20	
1.....	Heavy Aviation 3½-ton truck.....	111	3,600	328.20	
1.....	Heavy Aviation 3½-ton truck.....	112	3,600	328.20	
1.....	Kelly-Springfield 1½-ton truck.....	190	1,800	225.00	
1.....	Kelly-Springfield 1½-ton truck.....	176	1,800	225.00	
1.....	Packard 2½-ton truck.....	203	1,000	325.00	
1.....	Packard 2½-ton truck.....	207	1,000	325.00	
1.....	Heavy Aviation 3½-ton truck.....	199	3,600	-----	\$325.00
16.....	Totals.....		\$48,200	\$4,702.93	\$325.00

This means that there has been given to the citizens of Elko County road-building equipment of a minimum market value of \$48,200 at a cost to them of less than 10% of such value. In addition to this the department has purchased in carload lots supplemental equipment such as dump bodies and hoists at prices ranging from 10% to 25% under market prices, which have been delivered to Elko County at actual cost, thus effecting a very material saving to the taxpayers of the county. It is also anticipated that we will receive considerable additional equipment from the War Department, of which Elko County will receive its just proportion.

ESMERALDA COUNTY

In Esmeralda County the problems of state highway construction have required special study on account of the fact that this territory is a strictly mining locality, and roads are subject to extremely heavy traffic during boom periods and to practically no travel at all during the recession of such booms. Fortunately the natural characteristics of that portion of the county where the state highway is located are very favorable to road construction, the soil consisting chiefly of disintegrated granite formation, making excellent roads.

Two routes of the State Highway System are located in Esmeralda County—Route No. 3, extending from the Nye county-line, which is practically the city limits of Tonopah, through Goldfield and thence on through via Lida to the Nevada-California state-line near Lida; and Route No. 5, extending from the branch of the Lida road south of Goldfield toward Beatty. Construction on only one project has been undertaken in Esmeralda County to date, being as follows:

Tonopah to Millers Cut-off Road

Project statement covering this project was submitted to the Federal Government on October 28, 1918, being Federal Aid Project No. 11. and provided for the improvement of approximately 9 miles between

the south city limits of Tonopah and what is locally known as Millers cut-off road. At the time this project was submitted the Divide boom had not yet materialized. Improvement was to consist of a graded road 15 feet wide, which, at that time, was thought ample to take care of traffic. The project was placed under contract to Mr. John O'Keefe on April 29, 1919, and almost coincident with the beginning of construction work the Divide boom was on. It immediately became apparent that a width of 15 feet would not take care of traffic to the Divide District. Therefore the project was amended and the width increased to 18 feet.

The construction conditions on this contract have been unfavorable, owing to the fact that the State found it necessary to take over the completion of the contract before it was more than half done.

On the basis of present estimates the total cost of the job will stand as follows:

Federal Government—50%.....	\$22,168.93
Esmeralda County—25%.....	11,084.46
State share—25%.....	11,084.47
Total estimated cost.....	\$44,337.86

The contract was completed on October 23, 1920, and is now open to traffic.

Survey and Reconnaissance of State Highway Locations

Survey has been made of the entire route between the end of the above contract and Goldfield. The present road over this section is a fair desert road, but some portions of it will require improvement, and it is probable that this section will be taken up for improvement just as soon as possible. The road between Goldfield and Beatty is now an excellent road, only requiring the improvement of short sections.

Finances

Department income and expenditures in Esmeralda County from 1917 to date have been as follows:

		REVENUE		
<i>Tax year</i>	<i>Valuation</i>	<i>Levy</i>	<i>State Highway Fund</i>	<i>County-State Highway Fund</i>
1917.....	\$5,874,744.00	7 cents	\$3,972.32	\$3,972.32
1918.....	5,551,586.00	10 cents	5,551.58	5,551.58
1919.....	5,909,063.00	10 cents	5,909.06	5,909.06
			\$15,432.96	\$15,432.96
EXPENDITURES				
<i>Calendar year</i>	<i>Surveys and plans</i>	<i>Maintenance</i>	<i>Construction</i>	<i>Total</i>
1917-1918.....	\$1,385.19	\$1,881.94		\$3,267.13
1919.....	307.45	3,550.20	\$16,962.52	20,820.17
1920.....	41.25	935.93	36,318.41	37,295.59
Total expenditures in Esmeralda County.....				\$61,382.89

EUREKA COUNTY

Eureka County is one of the counties of the State which has a small population and small valuation, together with considerable road mileage. The county is crossed by two routes of the State Highway System—Route No. 1, crossing the north end from the east Lander county-line on the west to the west Elko county-line on the east, a distance of 20 miles, and Route No. 2, crossing near the south end from

the east Lander county-line on the west to the west White Pine county-line on the east, a distance of approximately 56 miles. Construction conditions in this county are parallel with those in Lander County on the west, the county being practically of the same area and population and with topographical conditions almost identical. As an aid to bridge the gaps of the State Highway System across this county it is the intent of the department to advance funds from the authorized state bond issues. This is necessary in order to go ahead with any considerable amount of improvement, as the income from the county is limited and would require accumulation of the income over a period of several years in order to attempt any work of considerable magnitude. Early in 1917 a complete survey of Route No. 1 across the north end of Eureka County was made by this department, and it was the intent at that time to immediately proceed with the improvement of certain portions of this route in order to eliminate the notorious Boulder Flat, across which the then traveled road was located. Owing to difficulties which came up during 1917 and subsequent years, no actual construction work was begun in the county until the present year. Following a complete investigation of the various possibilities of location through the north end of the county, it was determined that the most feasible location was approximately to parallel the Southern Pacific and Western Pacific Railroads from a point known as Shoshone Point through the Dunphy Ranch, crossing the river near this point and swinging north through what is known as Welch's Canyon over the summit into Elko County and thence down into Carlin on the east side of the range. This leaves out the towns of Beowawe and Palisade. This was made necessary because of the utter impossibility of financing the construction of a road through the Palisade Canyon, as the entire floor of that canyon is occupied at the present time by the Western Pacific and Southern Pacific Railroads and the Humboldt River. To cut a roadway on a shelf above either of these railroads through this canyon would cost more money than the State would have available for construction in this county in a great many years. After a very complete investigation, therefore, the location as above designated was determined upon by this department.

The following report of the State Highway Engineer to the Board of Directors was the basis for the adoption of the location:

The following is a recommendation of your State Highway Engineer for the adoption of a certain route between Battle Mountain and Carlin, Nevada, as the route of the state highway between these points:

We have given the matter of the selection of a location for the road in that territory very serious thought and thorough field investigations; and the decision reached as a result of those field investigations is not the opinion of one man—in fact, Mr. West, the former State Highway Engineer, Mr. N. W. McCluskey, a former chief of party, and Mr. J. E. Smith, who had charge of some of the surveys in that vicinity, all concur with me in the selection of the route which is proposed herein.

The State Highway Act specifies that Route 1 of the State Highway System shall pass through the towns of Carlin, Beowawe, and Battle Mountain, and this, too, in spite of the

fact that there is at present no direct road passing through all of these places. Section 24 of the State Highway Act provides that, whenever it shall appear to the State Highway Engineer that any portion of the State Highway System as defined in that Act would be unreasonably expensive in its construction, he is empowered to divert or change said route as in his discretion may seem best. It is provided, too, that the recommendation of the State Highway Engineer shall be approved by your board.

The general topography of the country throughout this entire region is mountainous in character, and particularly is this true of the entire area between the stations of Farrel and Carlin. This mountainous area does not afford at any points satisfactory passes for highway construction except where the region is cut in two by the Humboldt River and by Welch's Canyon—a considerable distance north of that river. West of Farrel the valley of the Humboldt spreads out in a fanlike manner, so that at Battle Mountain this valley is probably six or seven miles wide, extending to the north of the Western Pacific Railroad station of Rennox. Through this fanlike valley of the Humboldt River there is no well-defined drainage channel, and the drainage of the valley in the winter and early spring months is very poor; overflow channels meander all over this section.

Owing to the present very unsatisfactory condition of the roads between Battle Mountain and Carlin, travel probably encounters more difficulties in negotiating that distance than through any other like section of our State Highway System.

The present road, as it is known to the public, first crosses the wide valley of the Humboldt River after leaving Battle Mountain and touches the north foothills of that valley at a point a short distance east of Rennox. It then follows along these hills to the west side of what is known everywhere as Boulder Flat. A distance of 12 miles is necessary to travel in order to cross this flat at this point so as to reach the foothills about 7 or 8 miles northeast of the White House ranch. From this point to Carlin no especially bad soil conditions are encountered, nor heavy grades—but the road has been located through the areas of least resistance to cheapen construction, and many unnecessary miles of travel are required to be made. The road, in fact, makes a very large loop to the north in order to avoid what has heretofore been termed by county officials as "heavy construction."

The two most serious sections of the present road between Battle Mountain and Carlin are the crossing of the valley of the Humboldt River north of Battle Mountain and the Boulder Flat—particularly the latter. I have been advised by people living in that region—and am aware to a small degree from my own observation—that to construct a satisfactory road across the Humboldt Valley north of Battle Mountain would entail the expenditure of a large amount of money for the construction of a high grade which is necessary in order to be above the flood-waters at certain seasons

of the year, and also to provide a roadbed above the ground water-line of this valley. The region is agricultural, and existing ranches have forced the location of this road in such a manner that it meanders through a considerable distance in order to reach the north side of the valley. To obtain an alinement for our road commensurate with the amount of money which we would be required to expend would necessitate the acquisition of new rights of way for almost the entire distance. Drainage structures would be many in number and very expensive to consider. Boulder Flat consists of a very wide and deep deposit of light alkali silt, absolutely unsuited for the foundation of any sort of roadbed. The soil is too light and shifting to be used in embankments for any sort of gravel or rock surface. It is very susceptible to washing by even the smallest amount of running water. At present the road would be considered in any other section of the country as impassable. In the summer it becomes a series of large and deep chuck-holes which often cannot be observed by the driver because they are filled with loose silt which, when hit by the wheels of a machine, acts like so much water. One cannot drive fast enough across this flat to keep out of his own dust. Ruts form in a single season from six to ten inches in depth, and these, too, in spite of the fact that travel has utilized a width of as much as 100 feet. In wet weather there is seemingly no bottom to the road, and automobiles and teams are often mired for hours until help can be secured. A mixture of this silt and water makes a soft, slippery, slimy surface to the road. The distance as given by our own log—and also by the Blue Book—is 62.5 miles between Battle Mountain and Carlin.

It was first determined that the location of any road between Battle Mountain and Carlin should pass through the neck of the canyon at Farrel or the White House ranch. West of that point a suitable location was easy to determine, and east thereof there were three possible locations to be given consideration. Between Battle Mountain and Farrel the determination of the route lay between a location just north of the Southern Pacific Railroad and one just south of that point. The location paralleling the railroad on the south was selected because it passes through a region of more stable soil, freer of low alkali flats, high above the flood-waters of the Humboldt River, and for the most part it is an existing road, and, with but little maintenance, can be made into a satisfactory temporary roadbed. The only change from this which might be considered would be to make a straight line from Battle Mountain to Argenta. This is unsatisfactory for two reasons, the first of which is that we would have to cross a portion of the Humboldt Flat; and, second, because there is some talk of straightening the railroad in about the same manner, which would probably cause future trouble with the company in the matter of its location, particularly in regard to railroad grade-crossings.

East of Farrel on to Carlin there are three possible locations—the first following the canyon of the Humboldt River passing through Beowawe and Palisade; the second over the Beowawe and the old Emigrant Pass road; the third across the Southern and the Western Pacific Railroad tracks and the Humboldt River to the White House ranch and thence in a northeasterly direction paralleling the general direction of Boulder Flat, but high above that valley, and then utilizing for the most part the existing traveled road to Carlin.

By adopting any one of these three possible locations it is necessary to cross at least once both the Southern and the Western Pacific Railroad tracks and the Humboldt River.

The canyon of the Humboldt River in the vicinity of Palisade is narrow and well defined in most places with precipitous walls. The river meanders through this canyon as much as it is possible for a river to do. It seems to strike one side of the canyon and is then diverted to the other side, where it is thrown back as before. This is partially shown on the sketch submitted as a part of this report. Both the Southern Pacific and the Western Pacific Railroads occupy the canyon in addition to the river. The railroads are both required to cross the Humboldt River in a number of places. Tunnels are frequent on both lines, and one crossing with each other is made just west of Palisade. The fact that the many river crossings, tunnels, and a railroad crossing are necessary is sufficient to show that the country is difficult for railroad location.

It would be difficult to thread our location through this canyon which is now so crowded with the river and railroads.

It was estimated by Mr. J. E. Smith, who made a thorough investigation of the country between Beowawe and Barth on October 3, 1917, that it would be necessary to move 50,000 cubic yards of earth, 15,000 cubic yards of solid rock, and 18,000 cubic yards of loose rock. It is my opinion that he has been conservative in his estimate, particularly as regards the classification of the material. I believe there would be a larger amount of solid rock.

It is true that there is some abandoned Southern Pacific Railroad grade in this canyon, but it is in very short sections, and, compared to the whole distance, does not amount to a great deal. This old grade has not been transferred to the State by the railroad company as have practically all other sections throughout the northern part of the State. It is doubtful if satisfactory arrangements can be made with the railroad companies for right of way, not only on this old grade, but across other sections of their congressional grant. It would be necessary throughout practically the whole line to keep within the 400-foot right-of-way grant. The distance from Farrel to Carlin by this route is approximately 37½ miles, of which 12 are of heavy canyon construction.

The second route we have considered is the one passing through Beowawe and the old Emigrant Pass. It has but very little to commend it except that the present road from the

White House ranch to Beowawe is in excellent condition and passes through a stable soil formation. From Beowawe to Carlin the road passes over two ranges of mountains, one of which may be called a pass, but the other seems to be a small summit. This is the route used by the first emigrants in passing through this territory and is now used by no one except the people traveling from Beowawe to Carlin. Twenty-three miles of this road pass through a rolling country, and easy grades with our location would be very hard to obtain. None of this route serves local people except those living in the vicinity of Beowawe, which is the only thing requiring that it be given consideration.

The construction would be heavy, nothing but steep grades could be obtained, and the high elevation necessary to cross the two ranges would cause it to be blockaded by snow for a portion of the year.

The third route to which we have given consideration is one commencing at Farrel and continuing on the south side of the Southern Pacific Railroad to Shoshone Point, which is one-half mile east thereof. It would then be necessary to cross the two railroad tracks and the Humboldt River to the White House, which is the headquarters of the Dunphy Ranch and about ten miles north of Beowawe; thence in a northeasterly direction to the western mouth of Welch's Canyon, a distance of approximately 8 miles. This is an existing road, high above Boulder Flat, but paralleling it on the east. The soil is a gravelly nature and capable, at least temporarily, of sustaining any traffic coming through this region. Almost direct alinement has been secured for this distance of eight miles. The construction is very easy, and the grades will probably not exceed 2%.

At the west mouth of Welch's Canyon this road junctions with the road crossing Boulder Flat, but the Boulder Flat road at this point goes in a northerly direction, making a large loop to the east end of Welch Canyon. We propose—and, in fact, have made our survey through Welch Canyon—to avoid this unnecessary loop. The distance through Welch Canyon is about 11 miles, and our location has been made so as to avoid grades exceeding 5%.

Some of this construction will be rather heavy, and it will run in the canyon probably as high as 20% solid rock. From the east end of Welch's Canyon to Carlin is the present traveled road offering no unusual difficulties of construction. In fact, a large quantity of suitable shale is available alongside the road for surfacing. The distance from Farrel to Carlin by this route is approximately 32 miles. There is not more than two miles in difference between the Welch Canyon route and the Emigrant Pass location. It appears that there are 23 miles of rolling country by way of the Emigrant Pass route as against 14 miles of rough country through Welch Canyon, the other portion of the Welch Canyon route being almost level and very easy to traverse. It appears that the canyon route would be $37\frac{1}{2}$ miles long as compared to 32 miles

by way of Welch Canyon. The Palisade road would require 12 miles of heavy canyon construction as against 6 miles of light canyon construction through Welch Canyon.

At the time of the location of the transcontinental telephone line a great amount of field investigation was made to determine the location of that line, and thought was given most seriously to snow conditions and the possibility of later constructing a road along that line for maintenance purposes. This transcontinental telephone line passes through Welch Canyon and down Maggie Creek to Carlin, and the decision of the telephone company should be given consideration when making our own location.

The Welch Canyon route traverses a territory now served by no other transportation facility, while the location through



**View of flats to be eliminated by Eureka-Hay Ranch Project
in Eureka County**

the canyon of the Humboldt River parallels two transcontinental railroad systems.

No detailed estimates of cost have been made as between the locations enumerated above, and they would be of no value except as a comparison. I would roughly estimate that the comparative costs of the different routes would be about in the following proportions: That through Palisade Canyon, 100; that by way of Beowawe and the Emigrant Pass, 75; and that by way of Welch Canyon, 60.

All of the heavy construction of this road is in northern Eureka County, and, on the basis of our scheme of financing the various road projects in this State, there is not now, and probably will not be for a long period of years, a sufficient amount of money in Eureka County fund to bear the proper proportionate share of this cost.

Using the above as a basis, and after your State Highway Engineer has made a thorough field investigation of all these

routes, he has no hesitancy in recommending to your board the adoption as a state highway between Battle Mountain and Carlin of the following route:

Leaving Battle Mountain on the south side of the Southern Pacific Railroad and going east, paralleling that road to Farrel; thence crossing the Southern and Western Pacific Railroads and the Humboldt River to the White House ranch-house; thence in a northeasterly direction to the west mouth of Welch Canyon; thence easterly through Welch Canyon to Maggie Creek; thence along the west side of the valley of Maggie Creek to Carlin, a distance of approximately 60 miles, which is very nearly identical with the railroad between those points.

Aside from the considerations given above, this route has the additional advantage that, when the one mile of road is constructed between Shoshone Point, which is just east of Farrel and the White House ranch, it can be utilized as the main road between Carlin and Battle Mountain; thus, with one short section of construction, eliminating Boulder Flat.

This short section will necessitate the making of a high fill requiring approximately 30,000 cubic yards of excavation and also the construction of a bridge across the Humboldt River at that point. A project statement has been submitted to the Secretary of Agriculture and approved by him for this construction. If the route as outlined above is adopted by your board, it is my purpose to construct this fill and bridge at the earliest possible date. On this same route a project statement has been submitted to and approved by the Secretary of Agriculture for that section between the west Elko county-line and Vivian, a distance of 9 miles. Vivian is the western terminus of the project now under construction in Elko County. Plans, specifications, and estimates are completed for this project.

No right-of-way difficulties are anticipated on this entire route. Considerable right of way will need be acquired from the Dunphy Estate, which has large holdings throughout the entire region. The location has been made in such a manner that all of it is entirely satisfactory to those people. At the time of making our survey we very freely consulted with Mr. Mahoney, the superintendent of the properties.

I trust that the above will be given your early and favorable consideration.

Taking up in detail the projects which are now under way or contemplated in Eureka County, we have the following:

Highway and Bridge at Dunphy—Route No. 1

The project statement was submitted to the Federal Government on March 21, 1919, providing for the improvement of that portion of Route 1 across Eureka County between the west Eureka county-line and the White House ranch, better known as Dunphy, a total length of 6.28 miles.

The improvement was to consist of a 20-foot roadbed, with 9 feet of

gravel surfacing 5 inches in depth, together with a 126-foot steel-truss bridge over the Humboldt River. The total estimated cost of the project, together with apportionments of costs, was as follows:

Federal Government.....	\$54,411.50
Eureka County.....	17,244.07
State share.....	37,167.43

Total estimated cost.....	\$108,823.00
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On June 15, 1920, a contract was let to the Missouri Valley Bridge and Iron Company for the furnishing of steel for the bridge portion of the above project. This steel was delivered at the site of the work during September, 1920, and the total cost of this portion of the project with apportionments is as follows, on the basis of present estimates:

Federal Government—50%.....	\$3,994.32
Eureka County—25%.....	1,997.16
State—25%.....	1,997.16

Total estimated cost.....	\$7,988.64
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This contract was followed by the letting of a contract for the erection of the bridge to the firm of Jenkins & Wells of Sacramento on July 12. This contract includes the erection of the structure with necessary piling, etc., together with sufficient excavation to make the bridge approaches. The total estimated cost of this job, together with apportionments to participants, is as follows:

Federal Government—50%.....	\$5,928.17
Eureka County—25%.....	2,964.08
State—25%.....	2,964.09

Total estimated cost.....	\$11,856.34
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The construction of the bridge is now under way, and should be completed about February, 1921.

The surveys for the remainder of the project are complete, as are also the plans, and the work will be begun just as soon as conditions become favorable.

Eureka-Hay Ranch—Route No. 2

Between the town of Eureka and what is locally known as Hay Ranch, on Route No. 2 across the southern end of the county, is located an extremely bad section of road consisting of approximately 8 miles across an alkali fiat. The Lincoln Highway Association has always earnestly desired the improvement of this particular section, it being considered one of the worst sections of road on the transcontinental highway. Pursuant thereto this project was designated as one of those for improvement in the gift of the Lincoln Highway Association to the State of \$120,000, made during the calendar year 1919, and that association set aside for aid in improving this particular section the sum of \$7,500 to be used in conjunction with federal, state, and county aid for necessary construction. Accordingly, on June 14, 1920, a project statement was submitted to the Federal Government for the improvement of this 12.2-mile section, with an 18-foot graded roadway with 10-foot gravel surfacing 5 inches in depth, with turnouts 18 feet wide approximately every 2,000 feet. The total estimated cost of this work, together with apportionments, is as follows:

Federal Government—50%.....	\$43,912.00
State.....	21,956.00
Eureka County.....	21,956.00
Total estimated cost.....	\$87,824.00

The surveys and plans for this project were completed early in 1920, and on September 13, 1920, bids were called for the construction of this section. Only one bid was received, however, and it was so greatly in excess of the estimate that it was decided to reject same and hold up the improvement of this section until the coming season, at which time, no doubt, construction conditions will be much more favorable than during the present year. The Lincoln Highway Association extended the period for the acceptance of their gift on this project to and including 1921, and we therefore hope that this project will be started during the coming year or as soon as weather conditions will permit.

Finances

The total income and expenditures in Eureka County, from date of organization of this department in 1917 to the present time, have been as follows:

Tax year	Valuation	REVENUE		County-State Highway Fund
		Levy	State Highway Fund	
1917.....	\$6,032,659.00	7 cents	\$4,222.40	\$4,222.40
1918.....	6,628,073.00	10 cents	6,628.07	6,628.07
1919.....	6,394,840.00	10 cents	6,394.84	6,394.84
Totals.....			\$17,245.31	\$17,245.31

EXPENDITURES

Calendar year	Surveys and plans	Maintenance	Construction	Total
1917-1918.....	\$2,754.34	\$211.48	.....	\$2,965.82
1919.....	1,404.47	991.08	.....	2,395.55
1920.....	4,612.73	.....	\$11,508.44	16,121.17
Total expenditures in Eureka County.....				\$21,482.54

Surplus War Material Delivered to Eureka County

No.	Equipment	Dept. No.	Market value	Cost to County
1.....	2½-ton Nash Quad truck.....	86	\$2,000	\$271.88
1.....	3½-ton Peerless truck.....	65	4,200	537.12

HUMBOLDT COUNTY

Before the division of Pershing County from Humboldt County, in point of area Humboldt County was next to Elko County. Only one route of the State Highway System is located through Humboldt County, being Route No. 1 along the main line of the Southern Pacific Railroad from the north Pershing county-line to the west Lander county-line on the east, with a total mileage of approximately 60 miles. In 1917 a project statement was submitted to the Government covering the improvement of a 17-mile section of road on this route, being between Lovelock and Zola, which was then located in Humboldt County, together with the construction of a reinforced-concrete bridge over the Humboldt River near Kodak. This was later followed by an additional project for the extension of this same section to a point

3½ miles north of Mill City, this additional extension being approximately 26 miles in length, making the total length of the two projects about 44 miles. Owing to construction difficulties and the attitude of the War Industries Board, together with various other factors, this construction work was not started during the year 1918, and at the 1919 session of the Legislature Humboldt County was divided into Pershing and Humboldt Counties. Both of these projects were included in the area divided off as Pershing County. This meant no projects approved and in line for improvement within Humboldt County as now constituted. Early in 1920 we began the preparation of project statements to submit to the Federal Government covering the road between Golconda and the east county-line, but just about the time they were submitted the question of roadway widths was brought up by the federal authorities and approval was refused on a roadway width of less than 24 feet. This eventually prevented further progress on the construction of any of these sections, despite the fact that the surveys were complete and the plans ready for preparation.

In this matter of roadway width the department is opposed to construction of a roadway greater than 21 feet in width on outlying projects, and in many cases only 18 feet, which carry traffic comparable with that in Humboldt County. The Bureau of Public Roads, however, has been most insistent for a minimum roadway width of 24 feet. This department takes the attitude that a 21-foot roadbed, which provides a 15-foot surface and 3-foot shoulders on each side, is ample for all traffic needs, both now and in the future, on 95% of the State Highway System. The item of this additional 3-foot width to meet the bureau requirements of 24 feet becomes a very serious financial one, and in many cases would prohibit the construction of contemplated projects because of lack of finances, or, if proceeded with, the 24-foot width would so reduce the length of the project as to seriously reduce the benefit to the territory adjacent to the project. The question of this roadway width was first raised by the Bureau of Public Roads during April, 1920, in the case of the plans for one of the projects in Pershing County, and the bureau flatly refused to approve plans for this and similar projects when a roadway width of only 21 feet was provided. This effectually stopped further progress on projects of this sort until the question of roadway widths was threshed out with the Federal Government. The matter was taken to the Chief of the Bureau, and after several months of negotiation, or during September, 1920, the bureau partly receded from its ruling as to minimum width and made a special provision that Nevada in specified cases would be permitted to construct roads of a minimum width of 18 feet for grading and of 10 feet for surfacing. A complete review of this matter appears in the section of this report devoted to the matter of federal aid.

Although we were partially successful in securing a revision of the requirements on this matter of roadway widths, it was too late in the season of 1920 to get construction under way in Humboldt County on contemplated projects. Construction of projects in Humboldt County has, therefore, been deferred until 1921.

Surveys and Reconnaissance of State Highway Locations

Surveys have been made of the sections between Golconda and the east county-line, and plans are now in course of preparation. Location through this section of the county follows the old abandoned Southern Pacific Railroad grade for a major portion of the distance, which will effect a material saving in the construction costs when the contracts are let. Reconnaissance has been made of the balance of the route in Humboldt County, and the locations definitely determined, although the location surveys have not yet been made.

Finances

Income and expenditures, during the life of the department, in Humboldt County as now constituted, have been as follows:

		REVENUE		
<i>Tax year</i>	<i>Valuation</i>	<i>Levy</i>	<i>State Highway Fund</i>	<i>County-State Highway Fund</i>
1919.....	\$17,687,370.00	10 cents	\$17,687.37	\$17,687.37
EXPENDITURES				
<i>Calendar year</i>	<i>Surveys and plans</i>	<i>Maintenance</i>	<i>Construction</i>	<i>Total</i>
1919.....		\$1,083.45		\$1,083.45
1920.....	\$2,539.32			2,539.32
Total expenditures in Humboldt County.....				\$3,622.77

Surplus War Material Delivered to Humboldt County

Under the Act of Congress making provision for the distribution of surplus war material to the state highway departments, there has been given to Humboldt County the following equipment:

<i>No.</i>	<i>Equipment</i>	<i>Dept. No.</i>	<i>Market value</i>	<i>Cost to Humboldt County</i>
1.....	Heavy Aviation truck.....	104	\$4,200.00	\$346.50
1.....	2-ton Nash Quad truck.....	154	4,200.00	222.67
1.....	3½-ton Kelly-Springfield truck.....	168	4,200.00	347.42
1.....	3½-ton Kelly-Springfield truck.....	169	4,200.00	347.42
1.....	3½-ton Kelly-Springfield truck.....	161	4,200.00	350.00
1.....	3½-ton Kelly-Springfield truck.....	164	4,200.00	350.00
6.....	Totals.....		\$25,200.00	\$1,964.01

There has also been purchased by the State for Humboldt County additional equipment for the above trucks consisting of dump bodies and hoists which were purchased considerably under the market price, and the advantage of this purchase was given to Humboldt County. In addition, Humboldt County will receive such equipment as it desires from the additional surplus war material which will doubtless be received by this department during the coming year.

LANDER COUNTY

In Lander County we have construction and location difficulties parallel to those of Eureka County, to the east. This county is also included in the group of poorer counties, with limited income due to small population, large area, and a low tax valuation. Two routes of the State Highway System cross this county—Route No. 1, near the north end, through Battle Mountain, and Route No. 2, near the south end, between Churchill County on the west and Eureka County on the east, the first having a length of approximately 25 miles in the county.

and the second about 62 miles. On Route No. 2 there are located two high mountain summits, one, the Austin Summit, having an elevation of about 7,500 feet. This particular summit has always been difficult to travel on account of steep grades and snow blockades during the winter months. This particular summit is located in the National Forest and is the class of road which could be improved under the provisions of section 8 of the Federal Aid Road Act, this section of the Act making provision for the improvement of highways within or adjacent to national forests.

The important question of location between the town of Austin and the west county-line is still up for decision. The travel in the past has always followed the way of New Pass Canyon between Eastgate and Austin, but this department has made some very thorough investigations of some other possible locations between Eastgate and Austin, and has narrowed the possibilities down to the location by



Typical desert road near Battle Mountain, in Lander County, on Route 1 of the State Highway System.

way of Peterson's Pass, Camel Creek, and Carrol Summit, and the present location by way of New Pass Canyon.

Recently a thorough reconnaissance was made of this location in company with officials of the Lincoln Highway Association, which association has agreed to advance the sum of \$42,000 toward aiding in the improvement of this section, and these officials left the final decision as to location to this department, stating, however, that it must be one of the two above-designated routes. This reconnaissance was also made in company with an engineer of the Bureau of Public Roads, and his recommendations concur with those of officials of the Lincoln Highway Association.

The department has now available complete data on the various routes, but the final decision as to location to be adopted has not yet been made.

Taking up in detail the projects which are under way and which are contemplated in Lander County, we have the following:

West Lander County-Line to Battle Mountain—Route No. 1

On December 28, 1919, a project statement was submitted to the Government providing for the improvement of that section of Route 1 located between the town of Battle Mountain and the south Lander county-line, a distance of approximately 9 miles. The preliminary improvement was to consist only of a graded roadway with drainage structures of reinforced concrete. Contract for this work was let to William Licking on April 29, 1919, and the work under the contract was completed in September of the same year. The total cost of the job to the various participants was as follows:

Federal Government.....	\$14,227.40
State share.....	7,825.99
Lander County.....	8,093.43
Total estimated cost.....	\$30,146.82

Further improvement of this section will consist of surfacing with gravel, which will be done in the near future.

Austin Summit—Section 8, Route 2

Early in the present year the United States Bureau of Public Roads started construction by force account of the road over Austin Summit, this construction going on under the provisions of section 8 of the Federal Aid Road Act. Under this section the work is handled exactly opposite to departmental work under the provisions of the balance of the Federal Aid Road Act. In this case the Government does the actual work, the State putting up 50% of the cost. It is also optional with the Government authorities whether or not they do the work by contract or by force account, and in this case they decided that it would be done by force account, as no satisfactory bids were received.

This project consists of the relocation of a large portion of this section of roadway, bringing it to a maximum gradient of 6%, together with permanent drainage structures. It is not expected that it will be necessary to surface any portion of this project, owing to the fact that the material is a disintegrated type of natural formation and makes a very satisfactory type of dirt road.

This project was completed in November of the present year, and as completed is one of the finest pieces of dirt-road construction in the State. The cost of this project, as near as can be determined at this time, will be as follows:

Federal Government—50%.....	\$35,000.00
State—25%.....	17,500.00
Lander County—25%.....	17,500.00
Total estimated cost.....	\$70,000.00

Survey and Reconnaissance of State Highway Locations

Surveys have been completed of the remainder of Route No. 1 across the north end of the county, and plans are practically complete for this entire section. In addition, considerable important reconnaissance work has been done on Route No. 2, and it is expected that additional projects will be gotten under way on Route No. 2 during the coming year in order to take advantage of the offer of the Lincoln Highway Association for aid in the improvement of the section between Eastgate and Austin.

Finances

Departmental income and expenditures in Lander County from 1917 to date have been as follows:

<i>Tax year</i>	<i>Valuation</i>	REVENUE		<i>County-State Highway Fund</i>
		<i>Levy</i>	<i>State Highway Fund</i>	
1917.....	\$5,574,179.00	7 cents	\$3,901.93	\$3,901.93
1918.....	6,299,855.00	10 cents	6,299.85	6,299.85
1919.....	6,396,323.00	10 cents	6,396.32	6,396.32
			<u>\$16,598.10</u>	<u>\$16,598.10</u>
EXPENDITURES				
<i>Calendar year</i>	<i>Surveys and plans</i>	<i>Maintenance</i>	<i>Construction</i>	<i>Total</i>
1917-1918.....	\$2,753.60	\$667.66	.....	\$3,421.26
1919.....	1,342.49	132.91	\$30,146.82	31,622.22
1920.....	192.60	.....	30,008.00	30,200.60
Total expenditures in Lander County.....				<u>\$65,244.08</u>

Surplus War Material Delivered to Lander County

<i>No.</i>	<i>Equipment</i>	<i>Dept. No.</i>	<i>Market value</i>	<i>Cost to Lander County</i>
1.....	3-ton Moreland truck.....	72	\$2,000.00	\$99.23
1.....	3-ton Moreland truck.....	74	2,000.00	99.23
1.....	34-ton Kelly-Springfield truck.....	165	4,200.00	350.00
3.....	Totals.....		<u>\$8,200.00</u>	<u>\$548.46</u>

In addition to the above equipment the county will be given its pro rata of additional equipment, which will doubtless be received from the Army from time to time.

LINCOLN COUNTY

No portion of the State Highway System is located in Lincoln County, and in accordance with the provisions of section 31 of the State Highway Act all revenue from Lincoln County is returned to the county, less the pro rata of administrative overhead of the department.

There has been given to Lincoln County, however, from the surplus war material received from the Government one Peerless truck valued at \$3,600, but which cost the county only \$460.37.

LYON COUNTY

In Lyon County the Highway Department has done a considerable amount of construction work. This county is a large agricultural and mining community, and required first attention in the way of improvement of roads. Early in 1917 a delegation of citizens of Yerington and vicinity made a special request to the department that Route No. 3 of the State Highway System be opened up by way of Wilson Canyon between Smith and Mason Valleys. This would give a connecting link along the West Walker River between these two valleys and mean a saving in distance over the then traveled road of approximately 12 to 15 miles. This construction would follow the Nevada Copper Belt Railroad through the canyon, and it presented many difficulties besides those of financing. Accordingly, a project statement was submitted to the Federal Government providing for the improvement of this canyon section, together with the necessary openings to the existing roads in Smith Valley.

Taking up in order the projects which have been submitted and the work which is now under way and contemplated, we have the following:

Wilson Canyon Section

Project statement covering the Wilson Canyon section was submitted to the Federal Government on May 11, 1918. The statement covered a distance of approximately 7 miles, being that portion between the Wilson Ranch, at the Mason Valley end of the canyon, to what is designated the Hudson-Aurora road, which is $2\frac{1}{2}$ miles east of Smith postoffice in Smith Valley. Approximately $2\frac{1}{2}$ miles of this was through the Wilson Canyon proper, consisting of very heavy construction, as well as moving a large amount of the track of the Nevada Copper Belt Railroad to get sufficient room between the railroad and the river for the construction of the highway. It also provided for a concrete-arch bridge over the West Walker River at Bulkhead and the construction of about $4\frac{1}{2}$ miles of graded roadway extending from the bridge on to the end of the project, the Hudson-Aurora road. Contract for the $4\frac{1}{2}$ miles of graded roadway was let to the firm of Niedt & Gavin on January 27, 1919, and this section was completed on August 2, 1919. The cost of this section, which consisted of a graded roadway 21 feet wide, with necessary permanent drainage structures, was as follows:

Federal Government.....	\$11,372.53
Lyon County.....	11,298.80
State share.....	6,955.65
	<u>\$29,626.98</u>

This contract was followed by the contract for the construction of the arch bridge over the river at Bulkhead, which was awarded to the firm of Parrott & Thompson on March 20, 1919. Unfortunately this contract was one of those held by the firm of Parrott & Thompson at the time they went bankrupt, and, owing to this fact, construction of the bridge was very much delayed—in fact, it was finally found necessary to permit the subletting of the contract to another contractor for completion. The work was, therefore, completed by J. L. Hoffmann as contractor on May 22, 1920. The cost of this job, as completed, was as follows:

Federal Government.....	\$5,518.34
Lyon County.....	7,791.07
	<u>\$13,309.41</u>

The contract for the canyon section between Wilson's Ranch and Bulkhead was let to the Nevada Construction Company on May 8, 1919. This particular contract included some extremely heavy work, and is one of the largest jobs undertaken by the department to date. The total length of the contract was only about $2\frac{1}{2}$ miles, but a very large percentage of the excavation was of solid rock, and therefore meant a very expensive piece of construction. In addition, we had to shift the tracks of the Nevada Copper Belt Railroad very extensively to permit of the location of the highway between the river and the railroad. The contract called for an 18-foot road, but no surfacing, the natural material being of such nature as to make a surfaced road unnecessary. The highway follows the curves of the river through the



The famous Wilson Canyon Highway in Lyon County. Along this portion the Copper Belt Railroad tracks were moved to allow sufficient room for highway between tracks and Walker River.



Approaching Concrete Arch Bridge, West Walker River, at Bulkhead, Lyon County, Mason and Smith Valley Highway via Wilson Canyon

canyon and is one of the finest scenic sections of state highway construction in the State—in fact, one of the finest scenic roads in the West. The construction of this section was completed in excellent shape, the contract being finished on February 27, 1920.

The final cost of this section was as follows:

Federal Government.....	\$18,016.69
Lyon County.....	26,256.63
State share.....	10,000.00
	<hr/>
	\$54,273.32

West Extension Wilson Canyon Road

The project statement covering the 2½-mile section between the end of the Wilson Canyon project and the existing road near Smith post-office was submitted to the Government on November 15, 1918. The improvement was to consist of a graded road 21 feet, with gravel surface 15 feet wide over the westerly one mile. Contract covering this portion was let to John Ross on June 15, 1920, and at this writing the project is nearing completion.

This extension completes the projected highway through the Walker River Canyon between Mason and Smith Valleys, and the cost of the project, as nearly as can now be determined, is as follows:

Federal Government—50%.....	\$12,804.64
Lyon County.....	6,402.31
State share.....	6,402.33
	<hr/>
	\$25,609.28

South City Limits of Yerington to 6¼ Miles South

This project is also another link in the Mason and Smith Valleys Highway via Wilson Canyon. Project statement was submitted to the Federal Government on December 28, 1918, covering this 6¼-mile section, and provided for the improvement of same with a 21-foot roadbed and a 15-foot graveled surface, the surface to be 5 inches thick after compacting, together with permanent concrete drainage structures.

This road follows through the rich agricultural section of Mason Valley, and is an important highway because it permits the ready movement of agricultural products to market. The contract for this section was let to H. Francisco on October 22, 1919, and the contract was completed on June 5, 1920. As it stands today it is an excellent graveled road requiring only nominal maintenance during favorable weather conditions until the surfacing becomes thoroughly compacted, which will probably not be accomplished for another season. The cost, as completed, was as follows:

Federal Government.....	\$23,155.06
Lyon County.....	12,585.61
State share.....	12,585.60
	<hr/>
	\$48,326.27

Wilson's Ranch to South End of Project 17

The project statement, submitted to the Federal Government on June 16, 1920, provided for the improvement of 6.9 miles between the south end of Project 17 and the beginning of the Wilson Canyon project. This project will complete the projected Smith and Mason Valley Highway via Wilson Canyon, giving the county an improved highway for a distance of approximately 24 miles into the heart of Smith Valley. The surveys and plans have been completed on this

section, and practically all necessary rights of way have been secured. It was intended to place this under contract during the past season, but, due to limited finances in Lyon County, this was found impossible. The improvement is to consist of a graded roadway 21 feet wide with 15-foot graveled surface, 5 inches thick after compacting, and is similar to the roadway constructed on the first 6½ miles south of Yerington. The estimated cost of the project, together with the apportionment to the participants, is as follows:

Federal Government—50%.....	\$49,753.00
Lyon County—25%.....	24,876.50
State—25%.....	24,876.50
Total cost.....	\$99,506.00

This project will be taken up and the contract let just as soon as funds become available in the county.

Surveys and Reconnaissance of State Highway Locations

Surveys have also been completed on Route 3 between Smith's postoffice and the Douglas county-line near Wellington. Complete reconnaissance has also been made of location between Yerington and Schurz, and the location to be followed when survey is made has been determined upon.

Finances

The departmental income and expenditures since organization to date in Lyon County have been as follows:

Tax year	Valuation	REVENUE		County-State Highway Fund
		Levy	State Highway Fund	
1917.....	\$7,840,848.00	7 cents	\$5,485.93	\$5,485.93
1918.....	9,784,723.00	10 cents	9,784.72	9,784.72
1919.....	10,331,311.00	10 cents	10,331.31	10,331.31
	Special deposit.....		10,000.00	10,000.00
			\$35,601.96	\$35,601.96
EXPENDITURES				
Calendar year	Surveys and plans	Maintenance	Construction	Total
1917-1918.....	\$3,968.58	\$764.29		\$4,732.87
1919.....	3,489.49	2,530.63	\$71,421.43	77,441.55
1920.....	3,201.84	2,954.37	85,096.54	91,252.75

Total expenditures in Lyon County.....\$173,427.17

The Legislature of 1919 authorized a bond issue of \$50,000 in Lyon County to aid in the improvement of the State Highway System. To date, however, no bonds have been issued.

Surplus War Equipment Delivered to Lyon County

Under the provisions of the Act of Congress apportioning surplus war equipment to the States, the department has allotted and delivered to Lyon County the following equipment:

No.	Equipment	Dept. No.	Market value	Cost to County
1.....	2½-ton Nash Quad truck.....	137	\$4,200.00	\$266.39
1.....	2½-ton Nash Quad truck.....	156	4,200.00	266.39
1.....	2½-ton Nash Quad truck.....	91	1,800.00	364.00
3.....	Totals.....		\$10,200.00	\$896.78

In addition, the State has acted as purchasing agent for the purchase of additional equipment for these trucks such as bodies and hoists at a

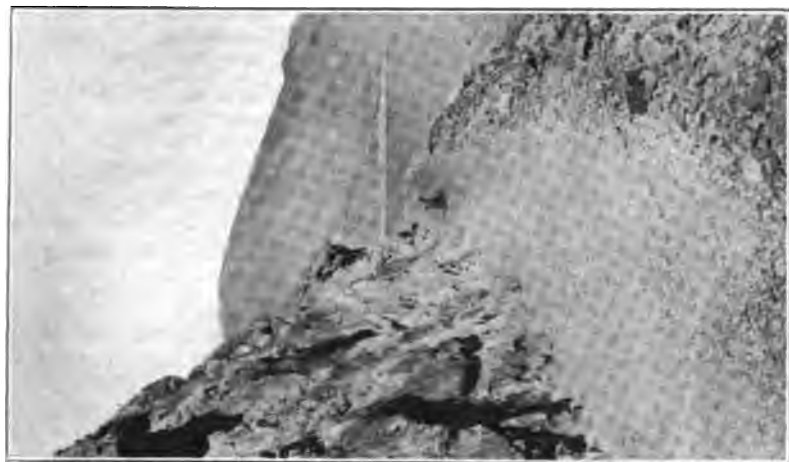
considerable saving to the county. The county will also be allotted additional equipment which will doubtless be received from the War Department.

MINERAL COUNTY

Mineral County has always desired a road along Walker Lake to give an all-year road between the south and the north end of the State and to eliminate the famous Lucky Boy grade which rises to an elevation of about 8,000 feet. To obtain this desire there were two possibilities, one road on the west side of Walker Lake and the other on the east side paralleling the railroad. These both presented enormous construction obstacles—that on the west side on account of extremely rugged country right down to the shore of the lake, and that on the east side because the entire distance consists of shifting sands. However, when the State Highway Act of 1917 was passed, in designating Route 3 of the State Highway System, the Act stated that the location should follow the west side of Walker Lake between Schurz and Hawthorne. One of the earliest investigations made by this department was the feasibility of construction of this section, and it was at once determined that it meant a large financial outlay to construct this road along the west side of Walker Lake. A considerable amount of money was spent in making reconnaissance and location surveys along this shore to determine the most practicable route for construction. These surveys were carried on throughout the year 1918 and a location finally determined upon. It was found that the costs were so excessive that there were no means at that time of meeting same, due to the limited income of the county and of the State from the county. At the 1919 session of the Legislature, however, an Act was passed authorizing Mineral County to issue bonds to the amount of \$30,000 to aid in the construction of this link in the State Highway System. The department therefore presented to the Federal Government on April 21, 1919, project statement providing for the improvement of a 10-mile section of this west-side road, being the section from Cottonwood Creek to a point 10 miles north thereof, taking the construction through the heavy rock portion of the work and up to an existing road on the north. The estimate of construction, as originally submitted, provided for a 15-foot road with maximum gradients of 6%, with necessary permanent drainage structures, and is estimated to cost \$148,060. A contract was let covering this 10-mile section to the Nevada Contracting Company on March 8, 1920, and the contract estimate of cost now stands at \$183,357.90. In addition, the State has just secured federal approval for the extension of the contract for 1.7 miles south from Cottonwood Creek to Dutch Creek, adding an additional \$16,705.15 to the cost. The total estimated cost of the job, as it now stands, then becomes \$202,362.05, to be paid from the following sources:

Federal Government.....	\$101,181.02
Mineral County.....	58,352.57
State share.....	42,828.46

At this writing the progress of the construction on this job is proceeding in excellent shape, and it is expected the contract will be completed in March or April, 1921. When this road is completed it will give to the State of Nevada a very fine scenic highway along the west shores of Walker Lake. The road is benched at an elevation of



Three views showing the rugged topography of the west shore of Walker Lake, along which a section of the State Highway System is being constructed. The center view is looking through one of the gorges toward the Lake, and the two end views show the highway being cut through the solid rock about 30 feet above the water-level of the Lake.

about 30 feet above the present water-level of the lake, and will give the passing motorist a close view of one of the most beautiful and well-known lakes in the State.

Many obstacles were encountered in the preliminary work for this contract, so the department found it necessary to purchase a motor-boat for the use of the survey crews in making surveys, and at least five separate and distinct locations were made along this shore before the location adopted was finally determined upon. This necessarily made a very expensive survey, but every successive survey reduced the construction cost twenty or thirty thousand dollars, so that money spent in surveys was a good investment. This job is one of the biggest single construction jobs yet undertaken by the department, both from the standpoint of cost and heavy work. The location of a great deal of this contract was inaccessible to even a saddle-horse, and the contractor found it necessary to ferry all equipment and supplies across the lake from the east side, and establish two separate construction camps to which all supplies are furnished by boat.

Finances

The income from Mineral County from taxation has been limited because of low valuation of the county. The following table will give in brief form the income and expenditures of the department to date in this county:

		REVENUE		
<i>Tax year</i>	<i>Valuation</i>	<i>Levy</i>	<i>State Highway Fund</i>	<i>County-State Highway Fund</i>
1917.....	\$4,597,784.00	7 cents	\$3,218.44	\$3,218.44
1918.....	4,901,769.00	10 cents	4,901.77	4,901.77
1919.....	4,632,240.00	10 cents	4,632.24	4,632.24
			\$12,752.45	\$12,752.45
Authorized county bond issue.....				\$30,000.00

EXPENDITURES				
<i>Calendar year</i>	<i>Surveys and plans</i>	<i>Maintenance</i>	<i>Construction</i>	<i>Total</i>
1917-1918.....	\$2,907.97	-----	-----	\$2,907.97
1919.....	5,741.81	-----	-----	5,741.81
1920.....	4,442.50	-----	\$82,490.39	86,932.89
Total expenditures in Mineral County.....				\$95,582.67

Surplus War Material Delivered to Mineral County

Surplus war material delivered to date to Mineral County consists of the following:

<i>No.</i>	<i>Equipment</i>	<i>Dept. No.</i>	<i>Market value</i>	<i>Cost</i>
1.....	3-ton Moreland truck.....	81	\$2,000.00	\$100.00
1.....	3-ton Moreland truck.....	82	2,000.00	100.00
1.....	1½-ton Kelly-Springfield truck.....	---	1,800.00	225.00
3.....	Totals.....		\$5,800.00	\$425.00

NYE COUNTY

In Nye County we have the largest county in the State, with the road problem as varied as the problem in Churchill County. Through this county are located portions of three state highway routes—the first being a section of Route No. 3 between Tonopah and Miller's; the second, practically the entire distance of Route No. 4 between Tonopah

and Ely; and Route No. 5 between Cuprite and Charleston Summit at the Clark county-line, a total State Highway System of 281 miles.

In reviewing the work in Nye County we have the following:

Tonopah to West Forest Boundary

On October 4, 1917, a project statement was submitted to the Federal Government providing for the improvement of the section of Route 4 located between Tonopah and the west boundary of the Monitor Division of the Toiyabe National Forest, a total distance of 14½ miles, being Project Statement No. 2. The improvement was to consist of a 15-foot graded roadbed with 9-foot gravel surface, with permanent drainage structures of reinforced concrete.

Contract covering this section was let to the Nevada Construction



Gravel Highway on Route 4 in Nye County. Built under Contract 6, Project 2.

Company on April 10, 1919, and the contract was completed on January 30, 1920. The final cost of the job was as follows:

Federal Government.....	\$24,766.45
Nye County.....	12,383.23
State share.....	12,383.22

Through Monitor National Forest, Section 8 **\$49,532.90**

Under the provisions of section 8 of the Federal Aid Road Act a request was made to the federal authorities in 1918 for the improvement of a 13-mile section through the Monitor Division of the Toiyabe National Forest between the east end of Federal Aid Project No. 2 and the Stone Cabin road. This project was approved and, after calling for bids, the federal authorities determined to contract same by force account, the State agreeing to bear one-half the cost and the Government to do the work. Accordingly construction on the project was begun early in 1919, and was completed late in that same year. The construction consisted of an 18-foot roadbed with no surfacing. The location is through a low mountain range, and the soil conditions are such that surfacing is not required except over a very small section.

This, together with Project No. 2, gives an improved road for about 27 miles east of Tonopah. The cost of this project is as follows:

Federal Government.....	\$22,516.83
State share.....	\$22,516.83
	<hr/>
	\$45,033.66

Currant Creek Project, Section 8

In addition to the Monitor section we have made application under provisions of section 8 for the improvement of what is known as the Currant Creek project, which provides for the improvement of a 12-mile section through the Nevada National Forest, partly in White Pine and partly in Nye County. Surveys have been completed on this project, and it is thought that the actual construction will be made during the year 1921. No estimates as to total costs of this project are as yet available.

Butler's Ranch to Troy Road

On November 15, 1918, we submitted a project statement to the Government for the improvement of a 25-mile section of Route 4 between Beatty and Troy road, improvement to consist of grading only 15 feet wide, with necessary permanent drainage structures. The surveys have been completed on this section, and the plans are also practically complete, but the construction so far has been held up on account of insufficient finances in Nye County. The original estimate as made up is on the basis of cost of \$40,700. However, because this was made in 1918 an estimate at present would show considerably higher cost. At this writing it cannot be determined just how soon this project will be taken up, but it will be started as soon as finances will permit.

Las Vegas and Tonopah Grade

A major portion of the Las Vegas and Tonopah grade between Beatty and Las Vegas is located in Nye County. On this grade the State has already expended a considerable amount of money, and present plans call for the expenditure of a great deal more in surveying sections which are now in bad condition, due to sand and silty material. A complete review of the activities on this grade is given under Clark County report, and also in the section of this report dealing separately with the Las Vegas and Tonopah grade.

Finances

Large area and small tax valuation have been conducive to a comparatively limited income from Nye County, and the State to date has shared very heavily in construction which has been carried on in this county. Future activities will be gaged to a considerable extent by funds which can be raised by the county itself.

Since organization we have received and expended in Nye County the following:

<i>Tax year</i>	<i>Valuation</i>	<i>Levy</i>	<i>REVENUE</i> <i>State Highway Fund</i>	<i>County-State Highway Fund</i>
1917.....	\$10,753,193.00	7 cents	\$7,527.24	\$7,527.24
1918.....	11,231,474.00	10 cents	11,231.47	11,231.47
1919.....	11,117,039.00	10 cents	11,117.04	11,117.04
			<hr/>	<hr/>
			\$29,875.85	\$29,875.85

<i>Calendar year</i>	EXPENDITURES			
	<i>Surveys and plans</i>	<i>Maintenance</i>	<i>Construction</i>	<i>Total</i>
1917-1918.....	\$1,532.74	\$1,307.35	.....	\$2,840.09
1919.....	7,486.32	3,833.24	\$33,944.28	45,263.84
1920.....	980.56	18,500.21	36,607.49	56,088.26
Total expenditures in Nye County.....				\$104,192.19

Surplus War Equipment Delivered to Nye County

We have to date allotted to Nye County the following equipment received from the War Department:

<i>No.</i>	<i>Equipment</i>	<i>Dept. No.</i>	<i>Market value</i>	<i>Cost to Nye County</i>
1.....	2-ton Nash Quad truck.....	114	\$4,200.00	\$298.61
1.....	2-ton Nash Quad truck.....	132	4,200.00	298.61
2.....	Totals.....		\$8,400.00	\$597.22

The county will also be allotted its pro rata of additional equipment which will be received from the War Department and the State.

ORMSBY COUNTY

Ormsby County is the smallest county in the State, and also has lowest assessment valuation. The valuation is probably due in a large extent to the fact that the Capitol of the State is located in Carson



Crushing rock in Ormsby County for Carson City-Lakeview section of State Highway.

City in this county, and the major portion of the property in the town belongs to the State, which is, of course, exempt from taxation. In addition, there is a large amount of government property which is exempt in the same manner. This fact makes very difficult the financing of any extensive highway improvement in the county.

Route No. 3 of the State Highway System crosses the county from the north to the south, and extends to the Douglas county-line on the road to Lake Tahoe.

To date only one project statement has been submitted to the Government covering work in Ormsby County. This section is between

Carson City and the county-line at Lakeview, and is part of the Reno-Carson City road. It is contemplated to improve this road with a hard-surfaced pavement consisting of concrete 15 feet wide. The total cost of the job is estimated to be \$125,818.59.

On April 26, 1920, a contract was let to the Pitt-Taylor Syndicate for the grading of a portion of this section extending from the Summit at Lakeview to the property of the Shaffer Estate north of Carson City. This contract was completed in August of the same year.

As this report is written bids are being called for the completion of this project, consisting of the balance of the grading and the laying of the concrete surface. This project, will, therefore, be completed during the coming construction season. The crushed rock for the pavement is available in a stock pile near Carson City, and the necessary sand and cement will be shipped in as needed.

Finances

The department income and expenditures in Ormsby County from 1917 to date have been as follows:

Tax year	Valuation	REVENUE		County-State Highway Fund
		Levy	State Highway Fund	
1917.....	\$1,645,297.00	7 cents	\$1,151.70	\$1,151.70
1918.....	1,750,758.00	10 cents	1,750.76	1,750.76
1919.....	1,746,082.00	10 cents	1,746.08	1,746.08
			\$4,648.54	\$4,648.54
EXPENDITURES				
Calendar year	Surveys and plans	Maintenance	Construction	Total
1917-1918.....	\$354.38	\$1,814.77	-----	\$2,169.15
1919.....	716.66	1,076.58	-----	1,793.24
1920.....	1,014.91	1,533.75	\$21,117.04	23,665.70
Total expenditures in Ormsby County.....				\$27,628.09

Surplus War Equipment Delivered to Ormsby County

There has been delivered to Ormsby County and Carson City the following equipment which was received from the War Department:

No.	Equipment	Dept. No.	Mkt. value	Cost to County	Cost to Carson City
1.....	3-ton Moreland truck.....	77	\$1,800	\$99.23	-----
1.....	3-ton Moreland truck.....	80	1,800	99.23	-----
1.....	1½-ton Kelley-Springfield truck.....	180	2,000	-----	\$225.00
3.....	Totals.....		\$5,600	\$198.46	\$225.00

PERSHING COUNTY

Up to March 18, 1919, Pershing County, as now constituted, was a portion of Humboldt County. Pershing County was created by the 1919 session of the Legislature. It so happened that the two projects in Humboldt County which had been undertaken by this department fell within the bounds of Pershing County. Inasmuch as part of the construction work had already been completed, there was necessarily some confusion as to the division of income and expense between Pershing and Humboldt Counties. It has been recognized that one of the worst pieces of road in the State of Nevada is the section between Lovelock and Winnemucca, particularly the section between Lovelock and Rye Patch on Route 1 of the State Highway System. Therefore



Fifteen-foot gravel highway in Pershing County



Eighteen-foot gravel highway in Pershing County.

the first project submitted by this department to the Federal Government called for the improvement of 17 miles of this bad section. This was later followed by an additional project of 26 miles, which, together with the first one, entirely covered the bad-road section on this route.

Taking up the projects in the order in which they have been started in the county we have the following:

Lovelock to Zola

This project statement was submitted to the Federal Government on October 18, 1917, and provided for the improvement of 17½ miles of road located between Lovelock and a point designated as Zola, which is about two miles east of Oreana. Improvement was to consist of a 21-foot graded road with a 15-foot graveled surface for the first three



Completed Gravel Highway in Pershing County

miles east of Lovelock, the balance of the surface to be 10 feet wide, together with a reinforced concrete-pile trestle over the Humboldt River at Kodak. Several attempts were made to start construction during 1918, but no satisfactory bids were received. Finally, however, contract was let on January 27, 1919, for the construction of the bridge over the Humboldt River at Kodak, the contract being awarded to the firm of Parrott & Thompson. This bridge was completed on December 7, 1919, and the final cost of construction was as follows:

Federal Government.....	\$6,540.25
Pershing County.....	3,374.36
State share.....	3,374.30
	<hr/>
	\$13,288.91

On November 18, 1919, a contract was let to P. A. Quigley of Lovelock for the construction of the roadway on this project. This contract was completed on October 2, 1920, and the final construction costs were as follows:

Federal Government.....	\$53,434.21
Pershing County.....	26,717.11
State share.....	26,717.11

\$106,868.43

The completion of this project in its entirety marked the first improved graveled road of considerable length which was completed by this department. The road as it now stands is an excellent highway, and is gradually becoming better as it is compacted under traffic.

Zola to Mill City

A project statement was submitted to the Federal Government on January 22, 1919, for the improvement of a 31-mile section of road between Zola, which is the end of the previously mentioned project, and Mill City, paralleling the Southern Pacific Railroad. This project included the bad section of road mentioned heretofore in this report. A contract for this section was let to J. H. Causten and associates of Lovelock on April 20, 1920, the construction to consist of a graded roadway 20 feet wide with surfacing where found necessary, together with the necessary permanent drainage structures. At the date of this report this construction is moving forward and now stands 85% complete. It will be entirely completed early in the coming year. The estimate of costs on basis of contract let stands as follows:

Federal Government—50%.....	\$56,970.08
Pershing County—25%.....	28,485.02
State—25%.....	28,485.02
Total estimated cost.....	\$113,940.07

Surveys and Reconnaissance of State Highway Locations

In addition to the projects as above outlined, surveys have been completed for a considerable distance to the south of Lovelock on the Reno road, as well as a section to the north of the last-mentioned project towards Winnemucca.

Finances

Departmental income and expenditures in Pershing County since January 1, 1919, aggregate as follows:

Tax year	Valuation	REVENUE		
		Levy	State Highway Fund	County-State Highway Fund
1919.....	\$12,498,315.00	10 cents	\$12,498.31	\$12,498.31
From Humboldt County to County-State Highway Fund.....				8,470.00
EXPENDITURES				
Calendar year	Surveys and plans	Maintenance	Construction	Total
1917-1918.....	\$2,521.06			\$2,521.06
1919.....	3,768.36	\$3,382.94	\$24,190.46	31,341.76
1920.....	2,078.20	592.25	152,292.53	154,962.98
Total expenditures in Pershing County.....				\$188,825.80

Surplus War Equipment Delivered to Pershing County

There have been delivered to Pershing County the following trucks and other equipment:

No.	Equipment	Dept. No.	Market value	Cost
1.....	Heavy Aviation 3-ton truck.....	101	\$4,200.00	\$346.50
1.....	2-ton Nash Quad truck.....	153	4,200.00	222.67
2.....	Totals.....		\$8,400.00	\$569.17

STOREY COUNTY

No portion of the State Highway System is located in Storey County, and, in accordance with the provisions of section 31 of the State Highway Act, all revenue from Storey County reverts to the county, less the pro rata of administrative overhead of the department.

There have been given to Storey County from surplus war material received from the Government two Moreland trucks, with a total value of \$5,000 and at a cost to the county of approximately \$430.

WASHOE COUNTY

In Washoe County is situated the city of Reno, the metropolis of the State, and, inasmuch as this is a very wealthy county with the largest population of all the counties in the State, the matter of highway improvement has long had first thought. The State Highway System, as originally laid out by the Legislature of 1917, provides for two routes in Washoe County—Route No. 1, extending from the California line near Verdi to the Churchill county-line at Wadsworth, this route paralleling the Southern Pacific Railroad across the southern end of the county, and Route 3, extending from Reno south to the Ormsby county-line at Lakeview, being the major portion of the Reno-Carson City road. Early attention was given by the department to the matter of improvement of the State Highway System in Washoe County, chiefly because of the fact that this is the traffic center of the State and the roads were in such a condition that they required first attention. Prior to the creation of the State Highway Department this county spent enormous sums of money in maintenance work on its roads, from which there was no visible result, every season requiring a large expenditure year after year. In outlining the program of construction in Washoe County it was thought that the road requiring first attention was the one between Reno and Carson City, and particularly the first few miles south from Reno, which led through a very large agricultural valley. Many difficulties have been met in carrying on the work in Washoe County, particularly the scarcity of local materials, such as gravel and sand, and the acquiring of rights of way in a number of cases. Traffic on the State Highway System in Washoe County is of sufficient volume to justify hard-surfaced highways. Therefore, it was made the policy of the department from the beginning to build nothing but improved hard-surfaced types of pavement, providing same could be financed. That this policy has been a wise one is borne out by the gradually increasing number of hard-surfaced pavements emanating from the city of Reno. It has also been, doubtless, a factor in the forward step taken by the city in paving its city streets, a very large amount of such work having been done during the past season.

In reviewing the work done in the county we have the following :

Huffakers to Washoe Summit

This project was the first one to be taken up for improvement in Washoe County, project statement covering same being sent to the Federal Government on November 22, 1918. The original project was submitted with the intention of surfacing this section with gravel, which action was deemed advisable because of lack of finances to permit of hard-surfaced pavement. Later in 1919, however, funds became

available and the project was amended from graveled surface to a 15-foot concrete pavement. Therefore, the project as it now stands and as approved by the federal authorities provides for $9\frac{1}{2}$ miles of 15-foot concrete pavement 6 inches thick, with necessary concrete drainage structures. Under this project several contracts were let during the seasons of 1919 and 1920, being as follows:

Contract 14—Niedt & Gavin

This contract provided for the grading and structural work between Steamboat Springs and Washoe Summit, with exceptions of short sections through Pleasant Valley. The contract was let on August 27, 1919, and was completed in August, 1920, the total cost being as follows:

Federal Government.....	\$22,109.23
Washoe County.....	11,054.62
State share.....	11,054.62

\$44,218.47

This contract was followed by one let to the firm of Armstrong & Baker, designated as Contract 21, which provided for the construction of the section between Huffakers and the beginning of the Niedt & Gavin contract. This contract was completed during July, 1920, and the final costs were as follows:

Federal Government.....	\$15,025.02
Washoe County.....	7,512.51
State share.....	7,512.51

\$30,050.04

Contract was then let to J. Woods for the grading and structures on the section near Steamboat, which was completed during October, 1920, with the following cost:

Federal Government.....	\$2,675.40
Washoe County.....	1,337.70
State share.....	1,337.70

\$5,350.80

On the 10th day of May, 1920, contract was let to the Pacific States Construction Company for the paving with concrete, together with completion of necessary grading and structure work, of the entire project between Huffakers and Washoe Summit. Under this contract during the season of 1920 the pavement was laid from Huffakers to Brown's Siding, a distance of 2 miles, and from the foot to the top of Washoe hill, a distance of $1\frac{1}{4}$ miles. Owing to the coming on of winter weather it was necessary to close down this contract until the spring of 1921. Construction will be resumed immediately when weather conditions permit in the spring, and the balance of the pavement on this project should be laid early in the summer. The total estimated cost of the entire $9\frac{1}{2}$ miles of this project, on the basis of completed contracts and estimate of uncompleted work, is \$370,453.65.

Reno to Huffakers

On September 30, 1918 a project statement was submitted to the Federal Government for the improvement of the section between Reno and Huffakers, a distance of $5\frac{1}{2}$ miles. This was one of the heaviest traffic roads in the State, and we were successful on May 20, 1919, in

awarding a contract for its construction to the firm of Ward Brothers of Reno, Nevada, improvement to consist of an 18-foot pavement 6 inches thick, with 3-foot graveled shoulders on each side. During the year 1919 approximately three miles of this pavement were laid by the firm of Ward Brothers, or from the city of Reno south to a point approximately half a mile south of the Moffat Ranch. Unfortunately the firm of Ward Brothers went into bankruptcy during the winter of 1919, and when work opened up in the spring it was necessary for the bondsmen to take over this contract. Under the arrangement perfected with the bondsmen the completion of the contract was sublet to the Pacific States Construction Company, who went ahead with the construction, and the balance of the pavement to Huffakers was completed during August of the present year.

There was also constructed over Evans Creek, about $3\frac{1}{2}$ miles south of Reno, a 35-foot reinforced concrete-arch bridge. This was built by



Concrete Arch Bridge on Reno-Huffaker section of Reno-Carson City Highway. Built under Contract 31, Project 9.

the firm of Bishop & Griscom under separate contract. The total cost of completion of the entire project from Reno to Huffakers, on the basis of completed contracts and unpaid portions of contracts, aggregated the sum of \$193,554.53, the total cost being divided on the basis of 50% to the Government and 25% each to Washoe County and the State.

Reno to Sparks

On April 5, 1919, a project statement was submitted to the Government for the paving of the 1-mile section between the cities of Reno and Sparks. Improvement was to consist of a 24-foot concrete pavement, 6 inches thick, with 3-foot graveled shoulders on each side, on a 36-foot graded roadbed. On this project we have traffic conditions paralleling the traffic of a city street, because Sparks is located so near the city of Reno that it is almost a suburb thereof, and traffic during the morning and evening hours is extremely heavy over this road. Prior to the construction of the concrete pavement probably more money was spent for maintenance and repairs on this section than on any ten sections of equal length in Washoe County.



Laying Concrete Pavement, 18 feet wide, under Contract 12, Project 9, Reno-Carson City Highway.



Steam-Shovel Operations on Contract 147, Project 7, Reno-Carson City Highway, on the Washoe Hill.

On August 5, 1919, a contract was let to the Pacific States Construction Company for the laying of the pavement on this project, and the construction was completed on November 10, 1919. This section of pavement was the first concrete pavement completed and thrown open to traffic in the State of Nevada. The final cost of the contract was as follows:

Federal Government.....	\$19,400.00
State share.....	27,048.94
	<hr/> \$46,448.94

Washoe Summit to Lakeview

On March 8, 1920, a project statement was submitted to the Federal Government for the improvement of a 10½-mile section of Route 3 between the top of Washoe Summit (which is the south end of Project 7) and the Ormsby county-line at Lakeview, improvement to consist of a 15-foot concrete pavement on a 21-foot graded roadbed. This project was approved by the federal authorities and later divided into two sections—Section A being from Washoe Summit to Franktown, and Section B from Franktown to Lakeview. On May 5, 1920, a contract was let to the Pitt-Taylor Syndicate for Section A between Washoe Summit and Franktown. Under this contract construction work was carried on during 1920 and approximately 1½ miles of pavement were laid, beginning at a point half a mile south of Winters's ranch and extending to a point very close to Washoe Summit. In addition, the grading was completed from the end of the pavement to the top of Washoe Summit and from the south end of the pavement to Bowers Mansion. This contract will be completed as soon as weather conditions will permit in the spring, the approaching winter weather having compelled the closing down of the contract during the fall of the present year. As near as can now be estimated, the final cost of this section will aggregate \$212,304.72, the Federal Government paying 50% of the cost and Washoe County and the State the balance.

On Section B, extending from Franktown to Lakeview, two grading contracts have been let to W. J. Schmidt, which include the grading and structure work for the entire section. A contract will be let for the paving of this section just as soon as possible during the coming season, and this should mean the completion of the project with the pavement by the fall of the year 1921.

The final cost of this section, as near as can now be estimated, will be \$245,061.30.

Reno to Lawton Springs

On October 31, 1919, a project statement was submitted to the Bureau of Public Roads for the 4-mile section between Reno and Lawton Springs on the Reno-Verdi Road, providing for a 15-foot concrete pavement on a 21-foot roadbed, with 3-foot graveled shoulders. Surveys and plans have been completed on this section and have been approved by the Federal Government. Estimate of cost as presented in 1919 showed the total cost as \$153,168.40. A revision of this estimate will be necessary when the work comes up for contract, which will probably mean an increased cost. This project is on the program for improvement in 1921.

Reno-Purdy Road

At the request of the Board of County Commissioners of Washoe County we have submitted a project statement to the Federal Government asking for federal aid on the improvement of 15 miles of the Reno-Purdy road, being the section from the north city limits of Reno to the California line near Purdy. This road is not a part of the State Highway System, but is of the class of roads which can participate in federal aid under the terms of the Federal Aid Road Act. At the request of the Board of County Commissioners this department also made surveys and have gotten out plans for this road, the county bearing the entire cost of such surveys and plans. Definite decision as to type has not yet been made. However, it is thought that it will consist of a 15-foot asphaltic-concrete surface with a 21-foot roadbed, the cost to be borne equally by Washoe County and the Federal Government. This project, it is anticipated, will be completed during the season of 1921.

Finances

The departmental income and expenditures in Washoe County from 1917 to 1920 have been as follows:

<i>Tax year</i>	<i>Valuation</i>	REVENUE		
		<i>Levy</i>	<i>State Highway Fund</i>	<i>County-State Highway Fund</i>
1917.....	\$28,127,216.00	7 cents	\$19,699.05	\$19,699.05
1918.....	32,506,575.00	10 cents	32,506.57	32,506.57
1919.....	32,429,615.00	10 cents	32,429.61	32,429.61
			\$84,635.23	\$84,635.23

In addition, Washoe County was authorized by an Act of the 1919 Legislature to issue county bonds in the amount of \$500,000 to aid in the improvement of the State Highway System in Washoe County, this money to be available for the improvement of the State Highway System as designated, together with the Reno-Purdy road, hereinbefore mentioned. Of these bonds a considerable amount has been sold to carry on work during the past year, and the balance will be sold for the completion of the work in 1921.

EXPENDITURES

<i>Calendar year</i>	<i>Surveys and plans</i>	<i>Maintenance</i>	<i>Construction</i>	<i>Total</i>
1917-1918.....	\$7,600.27	\$3,967.05		\$11,567.32
1919.....	5,920.21	6,885.74	\$85,718.88	98,524.83
1920.....	9,404.47	4,282.76	441,748.00	455,435.23

Total expenditures in Washoe County.....\$565,527.38

Surplus War Material Delivered to Washoe County

We have delivered to Washoe County and the cities of Reno and Sparks from the surplus war equipment received from the Government the following units:

<i>No.</i>	<i>Equipment</i>	<i>Dept. No.</i>	<i>Market value</i>	<i>Cost to County</i>
1.....	2½-ton Moreland truck.....	75	\$1,800	\$99.23
1.....	2½-ton Moreland truck.....	79	1,800	99.23
1.....	Heavy Aviation 3½-ton truck.....	105	4,200	288.20
1.....	Heavy Aviation 3½-ton truck.....	106	4,200	288.20
1.....	2½-ton Nash Quad truck.....	117	4,200	806.25
1.....	2½-ton Nash Quad truck.....	115	4,200	279.66
6.....	Totals.....		\$20,400	\$1,860.77

No.	Equipment	Dept. No.	Market value	Cost to Reno
1.....	1-ton Kelly-Springfield truck.....	191	\$2,000	\$225.00
1.....	1½-ton Kelly-Springfield truck.....	196	2,000	225.00
1.....	2½-ton Moreland truck.....	282	3,200	225.00
1.....	1½-ton Kelly-Springfield truck.....	192	2,000	225.00
1.....	1½-ton Kelly-Springfield truck.....	193	2,000	225.00
1.....	1½-ton Kelly-Springfield truck.....	197	2,000	225.00
1.....	1½-ton Kelly-Springfield truck.....	177	2,000	225.00
1.....	1½-ton Kelly-Springfield truck.....	179	2,000	225.00
1.....	1½-ton Kelly-Springfield truck.....	184	2,000	225.00
9.....	Totals.....		\$19,200	\$2,025.00
No.	Equipment	Dept. No.	Market value	Cost to Sparks
1.....	3½-ton Kelly-Springfield truck.....	163	\$3,600	\$350.00
1.....	2½-ton Packard truck.....	204	2,000	325.00
2.....	Totals.....		\$5,600	\$675.00

Besides the above, 25 sets of artillery harness (market value, \$2,000), were allotted to Washoe County, at a cost of \$200.

WHITE PINE COUNTY

In White Pine County we have a rather unique financial situation from the fact that about 85% of the total taxes of the county are paid by the Nevada Consolidated Copper Company and affiliated concerns, and, inasmuch as taxation of mining companies is based on the net proceeds of mines, it means that the income fluctuates with the market price of mining products. This is graphically illustrated in White Pine County, the valuation in 1918 being \$22,880,000 and dropping down to \$17,524,000 in 1919, directly due to the drop in the copper market. Therefore, in outlining the construction program in White Pine County it has been necessary to take into consideration the probable increase or decrease in valuation of the county. In no other county in the State is this variation so marked as in this particular county.

Portions of two routes of the State Highway System cross White Pine County—Route No. 2 extending from the Utah line near Ibapah down to the city of Ely, thence west and via Illipah to the Eureka county-line; and Route 4 extending from the city of Ely to the White Pine county-line on the road to Tonopah.

Varied road-building problems are presented by these two routes, as the east-and-west route (No. 2) alternately crosses high mountain ranges and wide valleys. At the same time we have in White Pine County one of the heaviest traffic roads in the State—the section between Ely and the mines of Kimberly and Ruth. This road extends down Robinson Canyon parallel with the Nevada Northern Railroad and alternately crosses and recrosses this railroad about eleven times in a distance of 8 miles. Ely being the market center for this wide mining territory, this particular road has always carried heavy traffic, and the same holds true of the road between Ely and McGill, a distance of about 15 miles. McGill is a smelter town, and its trade largely goes to the city of Ely. When mining operations are in full blast at Kimberly and Ruth it is safe to say that jitney travel on the Robinson Canyon road is equal to like travel on the Reno-Sparks road in Washoe County.

Early attention was given to state highway construction in White Pine County, this department feeling that the position of this county



Fifteen-foot Gravel Highway in White Pine County between Keystone and Robinson Summit. Built under Contract 2, Project 6.



Two Dangerous Grade-Crossings over the Tracks of the Nevada Northern Railway between Ely and Keystone were eliminated by this short section of highway. Built under Contract 19, Project 25.

as one of the leaders in mineral production entitled it to first attention. Accordingly, one of the first groups of projects under the Federal Aid Road Act contemplated by this department included one in White Pine County. Taking the projects up in order we have the following to report:

Keystone to Robinson Summit

This project includes a distance of about 12 miles extending from the forks of the road at Keystone in Robinson Canyon up over a new location via Robinson Summit to Jake's Valley. The project contemplated the improvement with a 20-foot graded roadbed and a 9-foot graveled surface. Contract for this section was let to the Lincoln Construction Company on April 10, 1919, and the contract was completed during the year 1920. The final costs of the job are as follows:

Federal Government—50%.....	\$35,100.98
White Pine County—25%.....	17,550.49
State—25%.....	17,550.49
Total estimated cost.....	\$70,201.96

Railroad Grade-Crossing Elimination Near Lane City

In Robinson Canyon on the Ely-Kimberly road there were two particularly dangerous railroad crossings; one of them was at the mouth of a railroad tunnel, and on the other the view was entirely obstructed by projecting mountains on each side. The citizens of White Pine County have always earnestly desired the elimination of these two crossings, but it was an expensive piece of work, and the county could not see its way clear to finance this work. The department submitted a project statement to the Federal Government asking for aid on this short section, and, after approval by the federal authorities, we were successful in negotiating a deal with the Nevada Northern Railroad Company whereby the railroad company agreed to do the work at practically cost by making use of one of their steam shovels. The railroad company was willing to do this because they were continually in fear of a serious accident at either of these crossings, and it was good railroad policy to eliminate them if possible. On the basis of this cooperation we were able to consummate a very expensive piece of construction work at a very reasonable cost. The contract as completed cost the following amount:

Federal Government.....	\$2,652.52
White Pine County.....	2,652.53
	\$5,305.05

Robinson Summit to Illipah (Moorman's Ranch)

On October 28, 1918, a project statement covering this section (a total distance of 16½ miles) was submitted to the Federal Government. Improvement was to consist of a 20-foot roadway with a 9-foot graveled surface over about 10 miles of the distance. This section is a relocation for a large portion of its length, being an extension of Project No. 6. previously mentioned, and bringing it down to the existing road at Illipah. The original estimate of cost of construction on this project was \$94,000. However, should the contract be awarded it will be necessary to revise this estimate, as costs have gone up considerably since the time of preparation in 1918. The surveys and plans are complete for this section.

Surveys and Reconnaissance of State Highway Locations

Surveys have been completed on the remainder of Route 2 in White Pine County, both westward to the Eureka county-line and northward to the Utah state-line. On the section between Illipah and the Eureka county-line a relocation has been made following what is known as the Antelope Summit road which swings northward and eliminates the Hamilton road. On this section the Lincoln Highway Association has donated aid in the sum of \$7,500, and the contract with the association calls for completion during 1921.

Finances

The income and expenditures in White Pine County have been as follows:

		REVENUE		
<i>Tax year</i>	<i>Valuation</i>	<i>Levy</i>	<i>State Highway Fund</i>	<i>County-State Highway Fund</i>
1917.....	\$28,127,216.00	7 cents	\$19,689.05	\$19,689.05
1918.....	18,942,778.00	10 cents	18,942.77	18,942.77
1919.....	17,524,761.00	10 cents	17,524.76	17,524.76
			<hr/>	<hr/>
			\$56,156.58	\$56,156.58

EXPENDITURES				
<i>Calendar year</i>	<i>Surveys and plans</i>	<i>Maintenance</i>	<i>Construction</i>	<i>Total</i>
1917-1918.....	\$3,255.14	\$25.88	.....	\$3,281.02
1919.....	4,123.83	515.17	\$36,412.21	41,051.21
1920.....	5,217.42	250.00	30,747.06	36,214.48
				<hr/>
Total expenditures in White Pine County.....				\$80,546.71

Surplus War Material Delivered to White Pine County

Surplus war equipment delivered to White Pine County consists of the following:

<i>No.</i>	<i>Equipment</i>	<i>Dept. No.</i>	<i>Market value</i>	<i>Cost to County</i>
1.....	Peerless 3½-ton truck.....	60	\$3,600.00	\$276.22
1.....	Peerless 3½-ton truck.....	61	3,600.00	276.22
1.....	Peerless 3½-ton truck.....	63	3,600.00	544.45
1.....	Peerless 3½-ton truck.....	64	3,600.00	544.45
1.....	Peerless 3½-ton truck.....	66	3,600.00	544.45
1.....	Peerless 3½-ton truck.....	67	3,600.00	544.45
1.....	Peerless 3½-ton truck.....	69	3,600.00	544.45
			<hr/>	<hr/>
7.....	Totals.....		\$25,200.00	\$3,274.69

INVENTORY OF PROPERTY

1	Adding machine, Burroughs.	
1	Adding machine, Sundstrand.	
1	Automobile—Buick Touring No. 3.	
1	Automobile—Cadillac Touring No. 1.	
1	Automobile—Ford Roadster No. 5.	
1	Automobile—Ford Touring No. 12.	
1	Automobile—Ford Touring No. 16.	
1	Automobile—Ford Touring No. 17.	
1	Automobile—Ford Roadster, special delivery body, No. 18.	
1	Automobile—Buick Roadster No. 19.	
1	Automobile—Studebaker No. 22.	From War Department
1	Automobile—Studebaker No. 23.	From War Department
1	Automobile—Studebaker No. 24.	From War Department
1	Automobile—Studebaker No. 25.	From War Department
1	Automobile—Ford Touring No. 26.	From War Department
1	Automobile—Ford Touring No. 28.	From War Department
1	Automobile—Ford Touring No. 29.	From War Department
1	Automobile—Ford Touring No. 31.	From War Department
1	Automobile—Ford Touring No. 32.	From War Department
1	Automobile—Ford Touring No. 33.	From War Department
1	Automobile—Ford Touring No. 34.	From War Department
1	Automobile—Ford Touring No. 35.	From War Department
1	Automobile—Ford Touring No. 37.	From War Department
1	Automobile—Ford Touring No. 38.	From War Department
1	Automobile—Ford Ambulance No. 39.	From War Department
1	Automobile—Ford Ambulance No. 40.	From War Department
1	Automobile—Ford Ambulance No. 41.	From War Department
1	Automobile—Ford Ambulance No. 42.	From War Department
1	Automobile—Ford Ambulance No. 43.	From War Department
1	Automobile—Ford Ambulance No. 44.	From War Department
1	Automobile—Ford Ambulance No. 45.	From War Department
1	Automobile—Chevrolet Touring No. 47.	
1	Automobile—Ford Touring No. 48.	
1	Automobile—Ford Touring No. 49.	
1	Automobile—Ford Touring No. 50.	
1	Automobile—Ford Touring No. 52.	
1	Automobile—Ford Touring No. 53.	
1	Automobile—Dodge Touring No. 54.	
1	Automobile—Buick Roadster No. 55.	
1	Automobile—Ford Touring No. 56.	
1	Automobile—Ford Touring No. 57.	
1	Automobile—Ford Touring No. 58.	
1	Automobile—Ford Touring No. 59.	
1	Automobile—Ford Touring No. 310.	
1	Anvil No. 417.	
1	Auger, soil.	
1	Balance, with weights.	
1	Balance, with set weights.	
1	Balance, sensitive weighing.	
4	Barometers, aneroid.	
1	Blue-print machine.	
1	Bookcase (4 sections).	
1	Bookcase (2 sections).	
2	Bookcases (1 section).	
1	Boat (22-foot).	
1	Boat (14-foot).	
235	Boxes of harness.	From War Department
1	Cabinet, map-filing.	
1	Cabinet, form.	
2	Cabinets, filing—Berger.	
1	Cabinet, filing.	
1	Cabinet, wood, map-filing.	

- 1 Cabinet, single-drawer.
- 1 Cabinet, steel, filing.
- 1 Cabinet for ledger cards.
- 1 Cabinet, 4x6, with drawer.
- 1 Cabinet, 4-drawer, steel.
- 3 Cabinets, file, 2 drawers.
- 1 Cabinet, steel, filing.
- 1 Cabinet, filing.
- 1 Cabinet, steel, filing.
- 3 Cases, map-filing.
- 1 Case, card-index.
- 1 Case, steel, transfer.
- 6 Cases, steel, filing.
- 2 Chairs, No. 1051.
- 6 Chairs, folding.
- 3 Chairs, plain arm.
- 5 Chairs, revolving.
- 6 Chairs, typewriter.
- 4 Chairs, office swivel.
- 6 Chairs, office.
- 8 Chairs, No. 55.
- 6 Chairs, No. 707.
- 2 Chairs, plain, oak, No. 1051.
- 2 Checkwriters.
- 1 Chest, map (field use).
- 2 Chutes, unloading.
- 2 Compass, beam.
- 1 Compass, prismatic.
- 17 Compasses.....From War Department
- 1 Curve, railroad.
- 1 Crusher, rock.
- 1 Desk, double, flat-top.
- 1 Desk, flat-top.
- 8 Desks, flat-top.
- 2 Desks, field, small portable.....From War Department
- 1 Desk, bookkeeping.
- 3 Desks, roll-top.
- 1 Desk, steel.
- 6 Desks, typewriter.
- 1 Desk, Ped. T.W. No. 455.
- 1 Dictaphone shaving machine.
- 1 Dictaphone transcribing machine.
- 1 Dictaphone dictating machine.
- 1 Dictaphone machine.
- 3 Drags, road.
- 1 Drag, three-way.
- 2 Drags, Western, two-blade.
- 4 Drawing-boards.
- 1 Drill press.
- 1 Engine, gas, stationary.
- 1 Engine, scraper excavator.
- 1 Emery wheel.
- 3 Files, automatic desk.
- 1 File, auto card.
- 2 Files, card-index.
- 2 Files, tent.
- 2 Forges, Buffalo electric.
- 25 Forges, portable.....From War Department
- 1 Frame, blue-print.
- 1 Gage, depth.
- 1 Grader, Little Western Road.
- 1 Grader, Royal engine.
- 1 Gravel loader.
- 1 Hammer, Little Giant power.
- 1 Harrow.

1	Heater, electric.	
1	Holst, triplex block chain.....	From War Department
1	Hypsometer.	
1	Iron, electric.	
1	Kettle, asphalt.	
3	Lamps, brascolite.	
7	Lamps, desk, portable.	
1	Lamp, Rayo, kerosene.	
3	Lanterns, Coleman.	
120	Lanterns.....	From War Department
81	Lanterns, folding.....	From War Department
43	Levels, hand—Locke.	
2	Levels—Abney Hand.	
1	Level (Dumpy), and split-leg tripod, Dept. No. 1.	
1	Level (Dumpy), K. & E., Dept. No. 2.....	From War Department
1	Level (Dumpy), K. & E., Dept. No. 3.....	From War Department
1	Level (Dumpy), Y. & S. Dept. No. 4.....	From War Department
1	Level (Dumpy), Y. & S., Dept. No. 5.....	From War Department
1	Level (Dumpy), K. & E., Dept. No. 6.	
1	Level (Dumpy), K. & E., Dept. No. 7.	
1	Level (Dumpy), Berger, Dept. No. 8.	
1	Level (Dumpy), Berger, Dept. No. 9.	
9	Lights—Milburn.	
1	Machine, Fairbanks cement-testing.	
1	Machine, Marchant special.	
1	Machine, Millionaire calculating.	
3	Measures, map, circular.	
1	Motor, 75-hp.	
1	Neostyle, rotary.	
1	Numbering machine.	
6	Planimeters—Amslers.	
1	Planimeter No. 6606, special.	
2	Planimeters, polar.	
3	Planes, road.	
1	Plow, rooter No. 20.	
1	Plow, steel.	
1	Plow, road.	
1	Plow and grader.	
92	Plumb bobs.	
20	Poles, line, steel.	
3	Poles, line, wood.	
2018	Posts, fence.	
1	Pump, Barnes plunger.....	From War Department
2	Pumps, multistage.....	From War Department
25	Pumps, Red Jacket No. 323.....	From War Department
1	Pump, Barnes & Novo engine.....	From War Department
2	Pumps, centrifugal.	
1	Pump, with steel tank and sprinkler.	
1	Pump, gasoline.	
2	Pumps, lubricating.	
1	Rack, book, upright.	
38	Rods, level.	
1	Road roller, Austin.....	From War Department
1	Safe, office.	
1	Saw, hack, power.	
1	Scarifier, H. G. S.	
5	Scrapers, Fresno (4-foot).	
2	Stands, typewriter.	
8	Stools, draftsman.	
2	Stools, high.	
1	Stool, office.	
1	Stove, camp, and grate.	
5	Stoves, camp.	
1	Stove, cook.	

14	Tables, drafting.	
3	Tables, flat-top.	
1	Table, C. T. No. 460.	
1	Table, folding.....	From War Department
2	Tanks, steel, knock-down.....	From War Department
3	Tanks.....	From War Department
10	Tanks, water wagon.....	From War Department
1	Tank, water.	
31	Tapes, steel, 50-foot.	
41	Tapes, steel, 100-foot.	
1	Tape, steel, 300-foot.	
1	Threading-machine, bolt.	
2	Tents, 12x14.	
1	Tent, 16x20.	
1	Tent, 12x16.	
2	Tents, 10x12.	
2	Tents, 12x14.	
1	Tent, 8x12.	
7	Tents, 14x16.	
5	Tents (small).	
9	Tools, tape-mending.	
2	Toolboxes.	
1	Torch.	
1	Torch, Cutting "B."	
7	Transits, Gurley.	
8	Transits, Berger.	
1	Transit, K. & E.	
2	Transits, Lietz.	
1	Transit, Beckman.....	From War Department
1	Tray rack, No. 42.	
1	Truck-loader, Hercules.	
1	Tractor, Fordson No. 9.	
1	Tractor, Fordson No. 10.	
1	Truck, Ford No. 4.	
1	Truck, Ford, No. 6.	
1	Truck, White, No. 7.	
1	Truck, Ford, No. 8.	
1	Truck, Ford, No. 11.	
1	Tractor, International, No. 301.....	From War Department
1	Tractor, Cleveland, No. 302.....	From War Department
1	Tractor, Holt Caterpillar, No. 170.....	From War Department
1	Tractor, Holt Caterpillar, No. 171.....	From War Department
10	Trucks, Peerless, Nos. 60 to 69, inclusive.....	From War Department
2	Trucks, International, Nos. 70 and 71.....	From War Department
11	Tractors, Moreland, Nos. 72 to 82, inclusive.....	From War Department
18	Trucks, Nash, Nos. 83 to 100, inclusive.....	From War Department
12	Trucks, Heavy Aviation, Nos. 101 to 112, inclusive.....	From War Department
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2	Trucks, Kelly-Springfield, H. A., Nos. 198 to 199.....	From War Department
13	Trucks, Packard, Nos. 200 to 212, inclusive—2½ ton.....	From War Department
12	Trucks, Pierce Arrow, Nos. 219 to 230—5 ton.....	From War Department
42	Trucks, F. W. D., Nos. 231 to 272, inclusive—3 ton.....	From War Department
10	Trucks, Moreland, Nos. 272 to 282, inclusive—2½ ton.....	From War Department
7	Typewriters, Underwood.	
1	Typewriter, L. C. Smith.	
1	Typewriter, Royal.	
1	Vise, drill-press.	
1	Vise.	
1	Welding outfit, portable.	
6	Wheelbarrows.....	From War Department

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REPORT OF NEVADA COMMISSION ON COLORADO RIVER DEVELOPMENT

HON. EMMET D. BOYLE, *Governor, Carson City, Nevada.*

DEAR SIR: Your Commission, appointed to study questions relating to the development of the Colorado River, beg leave to report as follows:

We have held two meetings in Las Vegas, called by Col. J. G. Scrugham, Chairman of the Commission. At the first meeting held November 9, 1920, the Commission organized as follows: Col. J. G. Scrugham, Chairman; Ed. W. Clark, Vice-chairman; Charles P. Squires, Secretary.

A program of work to be undertaken was adopted, as follows:

1. To collect information on the various plans under consideration for the storage of water and the development of electrical energy in Boulder Canyon, or such other suitable sites as may be found.

2. To report to the Governor on such matters of legislation as may be deemed necessary in relation to such projects.

3. To formulate such measures for legislative action as may be deemed necessary to secure to the people of Nevada all possible benefits from such enterprises.

4. To give the moral support and assistance of the State, by any means deemed wise, to the Reclamation Service of the United States, or to any other public or private enterprise which may desire to undertake development projects in Nevada along the Colorado River.

5. To cooperate with other States lying within or partly within the Colorado River basin in arriving at an agreement as to the use of the waters of the Colorado River for irrigation and power development purposes.

REPORT ON BENEFITS TO NEVADA

A. Irrigation of Lands and Flood Protection.

It is estimated that there are several thousand acres of rich land lying along the bottoms of the Colorado River basin within the State of Nevada, which, if protected from floods, would be valuable for the growing of alfalfa, cotton, fruits, and other products suited to a semitropic climate. The development of such lands would add substantially to the taxable property of Clark County.

B. Development of Power.

The development of a great amount of electrical energy on the Colorado River would result in the following permanent benefits:

1. Electrification of the Los Angeles & Salt Lake Railroad, requiring the practical reconstruction of the road and the employment through several years of a large number of

men. Such reconstruction for electrical operation would give the railroad a largely increased valuation for taxation.

2. Cheap electricity for public and private uses in southern Nevada, with the resultant encouragement of all enterprises requiring power. In this subject we may mention the development of agriculture in the Las Vegas Valley through cheap power for pumping the surface waters for irrigation.

3. Cheap power for the mines of southern and eastern Nevada, which would result in the development and operation of many properties which now lie dormant because of the prohibitive cost of power. Power from Boulder Canyon would be available for the operation of mines at Ely, Pioche, Searchlight, Eldorado Canyon, Goodsprings, and other camps.

C. Incidental Benefits of Construction Operations.

The building of great works on the Colorado River, electrifying the railroad, and the building of power-lines would bring the employment of many men for several years to Clark County. It is believed that the population of Clark County would be multiplied several times by such activity, that the city of Las Vegas would become an important business center, and that the entire State would profit through the greater amount of taxable property which would be created, as well as by the permanent manufacturing and business enterprises which would result.

SECOND MEETING OF COMMISSION

At the second meeting of the Commission held December 9, 1920, an Act was outlined to give official standing to the Commission, provide for its necessary expenses, and enable it to protect the interests of the State of Nevada, and to secure to the people of the State the greatest possible benefits from any contemplated development. A copy of such proposed Act is herewith submitted for your consideration.

The impelling motive for the construction of the proposed Boulder Canyon project, the cost of which has been roughly estimated at \$50,000,000, is furnished by the needs of southern California, and the financing will in all probability come from that source. It may be said that Nevada will benefit only incidentally by reason of the fact that the proposed site is within the State. Nevertheless, there will accrue to Nevada large benefits and a greatly increased prosperity if her natural right to share in the benefits of such development made within her borders is properly safeguarded. It appears absolutely essential that the State of Nevada shall be represented by a commission having definite duties and powers in this matter.

Respectfully submitted,

**NEVADA COMMISSION ON
COLORADO RIVER DEVELOPMENT.**

By **CHARLES P. SQUIRES**, *Secretary.*

AN ACT

CREATING A COMMISSION TO BE KNOWN AS THE COLORADO RIVER DEVELOPMENT COMMISSION OF NEVADA, DEFINING ITS POWERS AND DUTIES, AND MAKING AN APPROPRIATION FOR THE EXPENSE THEREOF.

The People of the State of Nevada, represented in Senate and Assembly, do enact as follows:

SECTION 1. A commission is hereby created to be known as the Colorado River Development Commission of Nevada, to consist of the state engineer of the State of Nevada, and six other members, to be appointed by the governor. A majority of the said commissioners shall constitute a quorum for the transaction of business. Within thirty days after the passage and approval of this act, the governor shall appoint said commissioners and they shall hold office for a term of four years, or until their successors are appointed and qualified. Any vacancy shall be filled by appointment by the governor.

SEC. 2. The said commissioners shall have the following qualifications: They shall each be citizens of the State of Nevada, have a general knowledge of the development of the Colorado River and its tributaries within the State of Nevada, but at no time shall there be more than four of said commissioners members of the same political party.

SEC. 3. The governor may at any time remove any commissioner for neglect of duty or malfeasance in office.

SEC. 4. The members of said commission shall receive as compensation ten dollars for each day actually employed on the work of said commission and their actual and necessary expenses incurred in the performance of their duties.

SEC. 5. Within a reasonable time after the appointment of the members of said commission, they shall meet upon the call of the governor and effect an organization by electing one of their members chairman and one of their members secretary. The commission shall audit all bills for expenses and per diem of its members, and when the same shall have been certified to by the chairman and secretary, the secretary shall file the same with the state board of examiners for approval, and the same shall be paid out of any moneys appropriated for that purpose.

SEC. 6. The commissioners shall meet at such times and at such places as may be designated by the chairman.

SEC. 7. The duties of said commission shall be to collect and arrange all data and information connected with the Colorado River and its tributaries which may affect or be of interest to the State of Nevada; to present the same to the governor for his information; to represent the State of Nevada in such interstate or other conferences or conventions as may be called for the consideration of the development or reclamation projects connected with the Colorado River or

its tributaries; to tender the friendly cooperation of the State of Nevada to such constructive enterprises as look to the conservation of the waters of the Colorado River and its tributaries and the development of power thereon; to negotiate with the representatives of other states in endeavoring to equitably settle and define the rights of the states in the waters of the Colorado River and its tributaries; to report to the governor such measures for legislative action as may be deemed necessary to secure to the people of Nevada all possible benefits from such enterprises, especially in the development and use of electrical power.

SEC. 8. Said commission shall have the power to hold hearings, require the attendance of witnesses and take testimony whenever it shall deem it necessary in carrying out the provisions of this act. Any commissioner may administer oaths to any witness called to testify in any hearing or proceeding before the commission.

SEC. 9. For the purpose of carrying out the provisions of this act, the sum of ten thousand (\$10,000) dollars is hereby appropriated out of any moneys in the treasury not otherwise appropriated.

9



CARSON CITY, NEVADA

STATE PRINTING OFFICE, : JOE FARNSWORTH, SUPERINTENDENT

1921

STATE OF NEVADA

BIENNIAL REPORT

OF THE

STATE BOARD OF HEALTH

For the Period Ending December 31, 1920

S. L. LEE, M.D., Secretary



CARSON CITY, NEVADA

STATE PRINTING OFFICE : : : JOE FARNSWORTH, SUPERINTENDENT

1921



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STATE BOARD OF HEALTH OF NEVADA

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GEORGE BRODIGAN, Secretary of State.....Carson City
W. H. HOOD, M.D.....Reno
G. F. REUDIGER, M.D.....Reno
S. L. LEE, M.D., *Secretary*.....Carson City

BIENNIAL REPORT

The following is a report of the reportable diseases and other matters that came to the attention of the Nevada State Board of Health during the years 1919 and 1920:

SMALLPOX

During 1919 and 1920, smallpox, of a discrete type, developed in Churchill, Clark, Elko, Humboldt, Lyon, Nye, Ormsby, Pershing, Washoe, and White Pine Counties. It was epidemic in White Pine County during February and March, 1919, and in Washoe County during the months of May, June, July, and October, 1920.

MEASLES

In 1920 measles prevailed quite generally throughout the State, and was epidemic during the months of March, April, and May in Churchill, Washoe and White Pine Counties.

WHOOPING-COUGH

During the years 1919 and 1920 there were reported by the several local health officers of the State 318 cases of whooping-cough. The number reported was vastly short of the number of children afflicted with it, I feel quite sure, as 14 cases resulted fatally during the period mentioned.

Whooping-cough is only too often regarded as a simple benign disease—one that is peculiar to childhood, looked upon by parents as harmless, and rarely any effort is made to protect children from contracting it.

That parents may become familiar with the symptoms and danger resulting from this insidious enemy of the little ones, the following, from the pen of Dr. Leslie C. Frank, United States Public Health Service, was published by the Dallas Public Health Association:

"A CASE OF WHOOPING-COUGH HAS DEVELOPED IN YOUR NEIGHBORHOOD"

This notice is sent to the house in which the case of whooping-cough has appeared, and to all other houses in the neighborhood, so that every one may be informed as to the existence of the case, the nature of whooping-cough, how it is spread, how it may be prevented, what the quarantine rules are, and, finally, so you may know that if there is another case in your own house suspected of being whooping-cough, it is your duty under the Texas law to report this fact within twenty-four hours for investigation to the Health Department, even if you do not have a physician.

WHAT IS WHOOPING-COUGH?

Whooping-cough is a communicable disease which is caused by a germ found in the nose-and-throat discharges. The first symptoms are those of a simple cold which last about a week, followed by a number of weeks of a peculiar spasmodic cough ending in long-drawn-out inspiration accompanied by the well-known "whoop." The coughing spell often terminates with vomiting. Tuberculosis of the lungs and pneumonia frequently follow whooping-cough. It is estimated that whooping-cough killed over 10,000 children in the

United States in one year. Whooping-cough is especially fatal to children under one year of age. This shows that we are dealing with a really serious disease to which no mother should thoughtlessly expose her child "so as to have it over with." Such action is little short of murder.

HOW IS WHOOPING-COUGH SPREAD?

Whooping-cough is usually spread by coming into direct contact with a whooping-cough patient, or by breathing in the droplets expelled during the patient's coughing period. These droplets can easily reach a distance of five feet from the patient.

HOW MAY THE SPREAD OF WHOOPING-COUGH BE PREVENTED?

There is only one way to keep your child from becoming infected with whooping-cough, and that is to prevent it from going near or playing with another child which has the disease. If the parent of the child in your neighborhood who has whooping-cough permits it to play with your children, or any other children in the neighborhood, you should report this fact at once to the Health Administration. If there is a child in your neighborhood who has the suspicious symptoms, and there is no quarantine sign upon the house, you should report this address at once to the Health Administration on the blank provided. Your name will be kept absolutely confidential. All persons in your neighborhood have received this notice, and know that under the Texas law suspected cases must be reported by the head of the household, even if no physician is in charge of the case, and they will not be able to plead ignorance of the law when brought to court for failure to report.

WHAT ARE THE QUARANTINE REGULATIONS ON WHOOPING-COUGH?

The house in which the patient lives must be placarded with a whooping-cough sign. The sign may not be removed by any one but the Health Administration. The patient must be kept away from any children who have not had whooping-cough, and excluded from school and public places where other children are likely to be, as long as the sign remains upon the house. None of the other children in the house who have not had whooping-cough may be permitted to go to school or to any public gathering for fourteen days after their last exposure to the case. The patient may be permitted to go out of doors within the limits of the block in which it lives, inasmuch as out-of-door life is recommended for the treatment of whooping-cough; but in this case the child must wear at all times a broad yellow band about the left arm, so that it may be easy for other parents in the neighborhood to know which child has the whooping-cough, and must at all times be accompanied by a responsible attendant.

QUARANTINE REGULATIONS MUST BE STRICTLY OBEYED

You should obey quarantine regulations strictly, not only because they are law, certainly not because you fear the penalty, but because you are fair-minded enough not to wish to help spread a disease which *may* result in death and which *will* result in much needless suffering and expense. Be guided by your sense of duty and not by your fear of penalty.

The Texas law is very similar to the Nevada law as to contagious and communicable diseases, and what applies in that State applies with equal force in Nevada.

ANTHRAX

One case of anthrax developed in Churchill County in August, 1920, and resulted in death.

ROCKY MOUNTAIN (TICK) SPOTTED FEVER

One case of "tick" fever was reported from Humboldt County in May, 1919, and one from Washoe County in June of the same year. Both recovered.



At the conclusion of Dr. Geiger's investigation he wired the board as follows:

PIOCHE, NEVADA, August 19, 1920.

State Board of Health, Carson City, Nevada:

Six cases of mild gastro-intestinal disturbance occurred August 7 at Prince Mine. One death, named Gillespie, August 9. May and may not be connected with other cases. Final diagnosis will remain obscure. Cases not botulism. Canned goods absolutely not involved. Situation well handled by Hastings.

GEIGER.

RABIES OR HYDROPHOBIA

The following article, entitled "Rabies or Hydrophobia," was released by Dr. William C. Miller, Chief of Division of Public Health Education of Pennsylvania, on December 6, 1920, and contains such valuable information as to induce the Board of Health to publish it in this report:

PENNSYLVANIA STATE DEPARTMENT OF HEALTH

QUESTIONS

1. How is rabies contracted?
2. How should a dog-bite be treated?
3. What should be done with a dog suspected of rabies?

Almost every one knows the story of the heroic blacksmith, who, to save the village children, fought and killed the mad dog with his bare hands. Severely bitten in the struggle, to protect others from injury, in case madness should come upon him, with his own hands he riveted the iron band around his ankle and forged the chain which bound him to his anvil. Grateful neighbors brought him food and stayed to keep him company during the uncertain hours and days which must pass until his fate would be known. When his wounds healed rapidly, they wanted to file off his shackles, but the brave smith refused. Soon he noticed a numbness of his limbs and tingling sensations. It was difficult for him to swallow; then came thirst—unendurable thirst—that could not be assuaged, for even the sight of water was sufficient to cause violent spasms of the muscles of the throat. Hence the name "hydrophobia"—"fear of water." General convulsions followed, which were succeeded by paralysis and unconsciousness, and so he died.

A few generations later came the announcement from the laboratory of the great French scientist, Pasteur, that rabies or hydrophobia was preventable. Rabies is not conveyed from one person to another, but is always the result of infection from a lower animal, usually the dog, although it may be transmitted by horses, cows, cats, goats, or other animals.

The virus of the disease is found in the saliva, and is often present several days or a week before the animal exhibits signs of madness. Infection is usually caused by the bite of a rabid animal, but it may be induced by the mere licking of a hand upon which there is a break in the skin.

Persons have been known to contract the disease by scratching their hands on the teeth of horses or cattle they were drenching for some supposed other ailment.

The disease seldom makes its appearance before three weeks, and sometimes as much as three months or more elapse before it is manifest.

One day last summer Jimmy Downs, 10 years old, ran crying to his mother. "A dog bit me." Dr. Carson enlarged the wound, which was in the hand, in order to make it bleed freely, washed it out well, and cauterized it.

"What became of the dog?" he asked.

"The dog has been shot," said Jimmy's father.

"Too bad it was not captured alive."

"Why captured?"

"Because in a few days we should have known definitely whether or not the dog was rabid. Now his head must be sent to the diagnostic laboratory, and the Negri bodies (the certain signs of rabies) which are seen by the microscope among the nerve-cells of the brain may not be present, as they do not develop in the very early stages. Therefore other methods which will take longer will have to be pursued."

"Will the delay make any difference?"

"The earlier the diagnosis is made and the treatment begun, the better for the patient."

The doctor sent for the dead dog, which proved to be a fox terrier.

"Short-haired animals are more apt to contract rabies," he said, "than the long-haired type, because there is less chance for the saliva to be wiped from the teeth of the biting animal; for the same reason there is greater danger from bites in the hand or face than through clothing."

The entire dog, being a small one, was packed in ice and expressed to a diagnostic laboratory. Several days later a positive report came back.

Then Dr. Carson began giving Jimmy daily injections of the Pasteur emulsion which came regularly from the laboratory. At the end of three weeks he pronounced him out of danger of rabies.

There are two forms of rabies—the furious or excitable type, and the dumb type. In the latter the lower jaw is early paralyzed and often hangs down, giving the animal the appearance of having a bone in his throat; while, if the saliva is virulent, animals are dull and listless, and do not bite.

The first change noticed in a dog affected with the furious type of rabies is usually restlessness and a difference in his disposition. An affectionate dog may exhibit surliness or an ill-natured dog manifest a sudden fondness for his master by frequent attempts to lick his hands and face. The saliva is virulent at this stage.

Beware of restless and unduly affectionate dogs, especially if you know they have been bitten.

Later they appear to become delirious, biting at imaginary things and darting in fear from commonplace objects; soon they begin to bite and snap at other animals; they run aimlessly for long distances, biting and snapping at everything in their way. They drip saliva, but do not always froth at the mouth.

The Board of Poor Directors are required by law to furnish Pasteur treatment free, for persons unable to pay for it.

If for two years all dogs in the United States were required to be muzzled, hydrophobia would disappear from this country as it has from England, where such a law exists.

IN RELATION TO THE ADMISSION OF NEVADA INTO THE REGISTRATION AREA

On the 18th day of October, 1920, the following letter was received from Dr. Frederick R. Green, Secretary of the American Medical Association:

DR. S. L. LEE, *Carson City, Nevada.*

CHICAGO, ILL., October 15, 1920.

DEAR DOCTOR LEE: I am sending you under separate cover a copy of the last edition of the pamphlet "Why Should Births and Deaths Be Registered?" Would there be any possibility of getting the model law adopted in Nevada at the next session of your Legislature? There are only five States which have not adopted this law or its equivalent. Of these, Arizona, West Virginia, and Iowa will, I hope, adopt the law in January. In South Dakota the board is endeavoring to put the law in force in the form of board regulations, following the same plan that has worked successfully in Louisiana and several other States. I am very hopeful that in all of these four States action on this subject may be taken in January. This will leave Nevada as the only State without vital-statistics legislation that is acceptable to the Federal Census Bureau. Of course, your problems in Nevada are entirely different from those in one of the smaller, older, and more densely settled Eastern States. Yet the proper registration of births and deaths is just as important as a foundation for health work in your State as it is in any other. It may be necessary to make some modifications in the provisions for local registrars, but, aside from this, I do not see any reason why the same principles which have been worked out successfully in forty-three States should not be applicable to Nevada.

We have been carrying on a continuous campaign now for over sixteen years, and have succeeded in increasing the registration area, as the maps in the front of the pamphlet show. Without exception, the best results have been secured by inaugurating a campaign of education throughout the States two or three months previous to the meeting of the Legislature. This has been true largely for the reason that legislators do not pay much attention to vital-statistics registration if it is presented purely as a public-health measure. They

regard it as rather a useless provision for the gratification of the curiosity of doctors as to how many people have died and what they died of. As you of course know, the health aspects of birth-and-death registration are really not as important as the legal, social, and economic aspects of the question. The plan we have followed successfully has been to arouse the interest of lawyers, business men, educators, women's clubs, and others regarding the value and importance of birth-and-death registration aside from its public-health importance. This is what I have endeavored to bring out in the pamphlet. The problem involved in Nevada is not very large. There are only about 160 physicians in your State. According to the last newspaper directory, there are ten daily newspapers and twenty-six weekly newspapers. There are five women's clubs with a membership of over 100, according to the last directory of women's clubs. The number of school superintendents, members of boards of education, lawyers, business men, and business men's organizations, such as the local Chambers of Commerce, Rotary Club, etc., is probably not large. Including the Governor and members of the State Legislature, I should think that 1,000 copies of the pamphlet would be enough to put into the hands of every person interested in your State. If you wish to inaugurate such a plan of public education on this question between now and the 1st of January, I should be very glad to send you 1,000 copies of this pamphlet for distribution, or, if you prefer, to send any or all of them out to individuals from this office. We have been working on this problem now for many years. It is one of the most important and fundamental in the public-health field. I am greatly in hopes that the coming winter may see this work completed and the model law enforced in each one of the forty-eight States. I am sure you do not want to see Nevada be the last State to adopt the law. I shall be very glad, indeed, to be of any possible assistance to you in securing its adoption by your Legislature.

Cordially yours,

FREDERICK R. GREEN,

Secretary Council of Health and Public Instruction.

To this letter I made the following reply:

DEAR DOCTOR GREEN: The present law of Nevada was copied almost entirely from the model law, and was passed by the Legislature in 1919. It differs from the latter in minor details only, because of the great area of the State and its sparse population. The law has worked so successfully that I have no hesitancy in saying that 95% of the deaths have been reported, and fully 90% of the births.

This statement being true, wherein, may I ask, is it lacking as an equivalent of the model law, a successful registration of births and deaths being the chief aim of that instrument?

In view of the foregoing facts, why should Nevada be denied admission into the registration area?

Very truly yours,

S. L. LEE.

On October 26, 1920, Dr. Green replied:

DEAR DOCTOR LEE: I have your letter of the 20th, which I have read with much interest. I would not undertake to criticize your present vital-statistics law, or to point out its shortcomings. That is a task for the expert vital statistician. What I am interested in is in doing everything possible to help secure in each State a system of registration of vital statistics which will be acceptable to the Federal Census Bureau, so that the State can be admitted to the registration area of the United States Census Bureau, and so that we can have a uniform system of collecting, recording, and registering births and deaths throughout the entire country. The details by which this much-desired result are to be secured rest with the vital statisticians of the various States and the Federal Government. I have written Dr. W. H. Davis, Chief Statistician of the Division of Vital Statistics, Bureau of Census, Washington, D. C., forwarding a copy of your letter and a copy of the law, asking him to write you, pointing out what changes, if any, are necessary in your law, or your method of administration, in order to bring Nevada into the registration area.

Very sincerely yours,

FREDERICK R. GREEN.

Secretary Council of Health and Public Instruction.

On November 15, 1920, I received the following:

DEPARTMENT OF COMMERCE,
BUREAU OF THE CENSUS,
WASHINGTON, November 10, 1920

MY DEAR DOCTOR LEE: Replying to your letter of October time complying with the request of Dr. Frederick R. Council of Health and Public Instruction, who asked in the Nevada Vital-Statistics Law and to point out changes.

For the greater part your law is based upon the change, but in one important point it does differ markedly, if possible. A good registration law for any small registration districts (not over 50 or 60 square miles defined boundaries. It should also provide for a local registrar appointed and under the control of the State Board of Health. It should further provide that birth records and death records from the local registrars to the state registrar, and not to the county office. You can readily see that this plan, while it gives the state registrar much more complete and the local registrars than does your present law.

How many county health officers have you in Nevada?

How many deputy county health officers have you in Nevada?

If you could give to the State Board of Health the power to divide the State into registration districts and registrars, together with power of removal for cause, the State would undoubtedly appoint, so far as possible, the same acting as local registrars, so that the change would not be felt at first appear.

Hoping that you will be able to bring about these changes in Nevada law,

Very truly yours,

WILLIAM H.

Chief Statistician

On the 18th day of November, I wrote Dr. Davis:

DEAR DOCTOR DAVIS:

CARSON CITY, NEVADA

Your kind letter of the 10th instant is received, and I thank you for your prompt consideration of my inquiry, and for your advice.

The board will endeavor to have the present law amended as you suggest, but I must confess that I am doubtful of success. I will call for a substantial appropriation necessary for the purpose.

Districting of the State will prove to be the greatest obstacle, as our population is largely urban, or in close touch with the local health officer is acquainted with most of the adults who meet with but little trouble in gathering the vital statistics of births and deaths occurring therein.

As Nevada covers an area of 109,000 square miles, and with a population of 110,000, you can readily understand that more than 60 square miles would not contain half a dozen inhabitants. The willingness of the legislators to make an appropriation to compensate so many deputy local registrars for such service.

You say that "birth and death certificates should be sent to the registrar, and not delayed through any county office." In fact, that those certificates are so sent. The local health officers of several counties of the State for gathering the vital statistics of births and deaths occurring therein to the state registrar on the 1st day of each month. The local health officer is the sole custodian of birth and death certificates of his county, the original being sent to the state registrar, and the duplicate filed in his own office.

It is true that in most of the counties the local health officer performs the duties, i. e., as local representative of the State Board of Health.

While those officers are appointed by the several Boards of Health, they are instructed to perform such duties as the Board of Health may require in all health matters.

So far no friction has ever developed between the Board of Health and the Board of Health, the former ever having in its endeavor to protect the public health.

As the Nevada law differs so little from that of the model law, and believing that we secure as high a percentage of birth and death certificates as are reported from States within the registration area, I feel that the State of Nevada is legitimately entitled to admission in the sisterhood of registration States.

Please let me know your decision in the premises.

Sincerely yours,

S. L. LEE.

On the 4th of December I received the following letter from Dr. Davis, in answer to my inquiry of November 18:

DEPARTMENT OF COMMERCE,
BUREAU OF THE CENSUS,
WASHINGTON, November 29, 1920.

MY DEAR DOCTOR LEE: Your letter of November 18 was duly received. I fully appreciate the difficulties involved in securing a change in your law, but if it can be done you will be on a much better foundation.

If the expense involved be the chief objection, why not adopt the plan of raising money already in use in Kansas, charging an additional fee for each marriage license, and use this money to help pay the expenses of a law enacted in 1913, which reads as follows:

SEC. 4. The probate judge shall collect from the applicant for said license an additional registration fee of fifty cents. [This makes the total license fee \$1.50.]

SEC. 5. The probate judge shall, not later than the third day of each month * * * remit to the state registrar the fifty-cent fee provided for in section 4 of this act.

SEC. 6. The state registrar * * * shall keep an accurate account of all fees received from the probate judges and all other sources and turn the same over to the state treasurer not later than the fifteenth of each month. The fees thus collected and turned over to the state treasurer shall be used for the maintenance of the central division of vital statistics.

A similar provision for securing \$1 for each marriage license appears in a bill about to be submitted to the West Virginia Legislature.

The 25 cents which the model law gives to the local registrar for each birth and death return is certainly little enough, and the amount you would obtain by collecting a dollar for each marriage would just about take care of the expenditure of 25 cents to the local registrars for each birth and death report. If you wished to use it that way.

Could you not draw up a plan of your State so that the principal town and city districts could be assigned to your local health officers, and the outlying districts, which are sparsely settled, assigned to some public-spirited person in each district who would be willing to do the little work necessary for the small fee of 25 cents for each birth and death report sent in? A school teacher, a postmaster, or the wife of some farmer might be willing to act as local registrar.

Very truly yours,

WILLIAM H. DAVIS, M.D.,
Chief Statistician for Vital Statistics.

Here ends the correspondence upon this most important subject; but as the model law has been so frequently quoted, it is deemed a part of wisdom to give that law in full, that members of the Legislature may more fully comprehend its importance. The "Model Law" is printed farther on in this report, beginning at page 14.

I cannot agree with Dr. Davis in the matter of districting the State, nor that of securing the services of "public-spirited persons" to report births and deaths in the outlying districts for 25 cents for each birth and death report sent in. Experience has taught me that any work to be well done *must* be paid for in sums sufficient to induce the performer to apply his or her best efforts in its discharge.

That the State Board of Health should be the appointing power of local health officers is logical and wise. Being the local representatives

of the State Board in their respective counties, in that they should be responsible to that body and agree with Dr. Davis.

If the Legislature in its wisdom will make an appropriation to employ an epidemiologist or skilled bacteriologist in saying that Nevada will give as high a percentage of death reports as any State in the registration area.

EPIDEMIOLOGIST

In its biennial report for the year 1917-1918, the Board strongly recommended an appropriation sufficient for a full-time epidemiologist, giving the most efficient service possible.

The Legislature of 1919 appropriated the sum of \$1,500 for the salary of such a scientist and \$500 for expenses of the same for the year.

The amount appropriated was entirely insufficient for the full-time service of either an epidemiologist or bacteriologist. The board find any one willing to accept the position for part of the year, hence we were deprived of this necessary service, and the appropriation reverted to the treasury, thus leaving the Health Department without any specialist.

The law requires the Secretary of the Board to act as Registrar of Vital Statistics, to carefully compile and publish the various health officers of the State, keep the minutes of the board, attend to all correspondence in carrying out the law, investigate sanitary conditions and the health of the State, and to perform such other duties as the Board of Health may direct—quite an arduous task in view of the fact that he is denied the services of any clerical help or field assistants. When called to investigate epidemics or nuisance abatement, his office must remain closed until his return.

The employment of an epidemiologist would prove of great value to the board through his investigations of epidemics and outbreaks of contagious and communicable diseases throughout the State, and to advise local health officers as to the proper measures to be adopted for the prevention and control of such diseases. He should supervise all measures taken by the local health officers in the suppression and management of diseases, and perform such other duties as the State Board of Health may from time to time require. It is quite evident that, denied such service, the local health officers, in the nature of conditions, fail to accomplish the results so desired.

This appeal is not made for the benefit of the board, but for the protection of the citizens as a whole. The people pay taxes for the support of the various institutions of the State, and are therefore entitled to the best protection from the invasion of the State by so inimical to health and life that the State Board of Health is justified in making this appeal.

In this connection, I will say that Nevada is the only State in the Union that has no full-time officer connected with the Department of Health.

THE MODEL LAW

SECTION 1. That the state board of health shall have charge of the registration of births and deaths; shall prepare the necessary instructions, forms, and blanks for obtaining and preserving such records, and shall procure the faithful registration of the same in each primary registration district as constituted in section 3 of this act, and in the central bureau of vital statistics at the capital of the state. The said board shall be charged with the uniform and thorough enforcement of the law throughout the state, and shall from time to time recommend any additional legislation that may be necessary for this purpose.

SEC. 2. That the secretary of the state board of health shall have general supervision over the central bureau of vital statistics, which is hereby authorized to be established by said board, and which shall be under the immediate direction of the state registrar of vital statistics, whom the state board of health shall appoint within thirty days after the taking effect of this law, and who shall be a medical practitioner of not less than five years' practice in his profession, and a competent vital statistician. The state registrar of vital statistics shall hold office for four years and until his successor has been appointed and qualified, unless such office shall sooner become vacant by death, disqualification, operation of law, or other causes. Any vacancy occurring in such office shall be filled for the unexpired term by the state board of health. At least ten days before the expiration of the term of office of the state registrar of vital statistics, his successor shall be appointed by the state board of health. The state registrar of vital statistics shall receive an annual salary at the rate of dollars from the date of his entering upon the discharge of the duties of his office. The state board of health shall provide for such clerical and other assistants as may be necessary for the purpose of this act, who shall serve during the pleasure of the board, and shall fix the compensation of persons thus employed within the amount appropriated therefor by the legislature. The custodian of the capitol shall provide for the bureau of vital statistics, in the state capitol, suitable offices, which shall be properly equipped with fireproof vault and filing-cases for the permanent and safe preservation of all official records made and returned under this act.

SEC. 3. That for the purposes of this act the state shall be divided into registration districts as follows: Each city, each incorporated town, and each township shall constitute a primary registration district; *provided*, that the state board of health may combine two or more primary registration districts when necessary to facilitate registration.

SEC. 4. That within ninety days after the taking effect of this act, or as soon thereafter as possible, the state board of

each local registrar so appointed shall be four years, and until his successor has been appointed and has qualified, unless such office shall sooner become vacant by death, disqualification, operation of law, or other causes; *provided*, that in cities where health officers or other officials are, in the judgment of the state board of health, conducting effective registration of births and deaths under local ordinances at the time of the taking effect of this act, such officials may be appointed as registrars in and for such cities, and shall be subject to the rules and regulations of the state registrar, and to all of the provisions of this act. Any vacancy occurring in the office of local registrar of vital statistics shall be filled for the unexpired term by the state board of health. At least ten days before the expiration of the term of office of any such local registrar, his successor shall be appointed by the state board of health.

Any local registrar who, in the judgment of the state board of health, fails or neglects to discharge efficiently the duties of his office as set forth in this act, or to make prompt and complete returns of births and deaths as required thereby, shall be forthwith removed by the state board of health, and such other penalties may be imposed as are provided under section 22 of this act.

Each local registrar shall, immediately upon his acceptance of appointment as such, appoint a deputy, whose duty it shall be to act in his stead in case of his absence or disability; and such deputy shall in writing accept such appointment, and be subject to all rules and regulations governing local registrars. And when it appears necessary for the convenience of the people in any rural district, the local registrar is hereby authorized, with the approval of the state registrar, to appoint one or more suitable persons to act as subregistrars, who shall be authorized to receive certificates and to issue burial or removal permits in and for such portions of the district as may be designated; and each subregistrar shall note, on each certificate, over his signature, the date of filing, and shall forward all certificates to the local registrar of the district within ten days, and in all cases before the third day of the following month; *provided*, that each subregistrar shall be subject to the supervision and control of the state registrar, and may be by him removed for neglect or failure to perform his duty in accordance with the provisions of this act or the rules and regulations of the state registrar, and shall be subject to the same penalties for neglect of duty as the local registrar.

SEC. 5. That the body of any person whose death occurs in this state, or which shall be found dead therein, shall not be interred, deposited in a vault or tomb, cremated or otherwise disposed of, or removed from or into any registration district, or be temporarily held pending further

disposition more than seventy-two hours after death, unless a permit for burial, removal, or other disposition thereof shall have been properly issued by the local registrar of the registration district in which death occurred or the body was found, and no such burial or removal permit shall be issued by any registrar until, wherever practicable, a complete and satisfactory certificate of death has been filed with him as hereinafter provided; *provided*, that when a dead body is transported from outside the state into a registration district in Nevada for burial, the transit or removal permit, issued in accordance with the law and health regulations of the place where the death occurred, shall be accepted by the local registrar of the district into which the body has been transported for burial or other disposition, as a basis upon which he may issue a local burial permit; he shall note upon the face of the burial permit the fact that it was a body shipped in for interment, and give the actual place of death; and no local registrar shall receive any fee for the issuance of burial or removal permits under this act other than the compensation provided in section 20.

SEC. 6. That a stillborn child shall be registered as a birth and also as a death, and separate certificates of both the birth and the death shall be filed with the local registrar, in the usual form and manner, the certificate of birth to contain in place of the name of the child, the word "still-birth"; *provided*, that a certificate of birth and a certificate of death shall not be required for a child that has not advanced to the fifth month of uterogestation. The medical certificate of the cause of death shall be signed by the attending physician, if any, and shall state the cause of death as "stillborn," with the cause of the stillbirth, if known, whether a premature birth, and, if born prematurely, the period of uterogestation in months, if known; and a burial or removal permit of the prescribed form shall be required. Midwives shall not sign certificates of death for stillborn children; but such cases, and stillbirths occurring without attendance of either physician or midwife, shall be treated as deaths without medical attendance, as provided for in section 8 of this act.

SEC. 7. That the certificate of death shall contain the following items, which are hereby declared necessary for the legal, social, and sanitary purposes subserved by registration records:

(1) Place of death, including state, county, township, village, or city. If in a city, the ward, street, and house-number; if in a hospital or other institution, the name of the same to be given instead of the street and house-number. If in an industrial camp, the name of the camp to be given.

(2) Full name of decedent. If an unnamed child, the surname preceded by "Unnamed."

(3) Sex.

(5) Conjugal condition—as single, married, widowed, or divorced.

(6) Date of birth, including the year, month, and day.

(7) Age, in years, months and days. If less than one day, the hours or minutes.

(8) Occupation. The occupation to be reported of any person, male or female, who had any remunerative employment, with the statement of (a) trade, profession or particular kind of work; (b) general nature of industry, business or establishment in which employed (or employer).

(9) Birthplace; at least state or foreign country, if known.

(10) Name of father.

(11) Birthplace of father; at least state or foreign country, if known.

(12) Maiden name of mother.

(13) Birthplace of mother; at least state or foreign country, if known.

(14) Signature and address of informant.

(15) Official signature of registrar, with the date when certificate was filed, and registered number.

(16) Date of death, year, month, and day.

(17) Certification as to medical attendance on decedent, fact and time of death, time last seen alive, and the cause of death, with contributory (secondary) cause of complication, if any, and duration of each, and whether attributed to dangerous or insanitary conditions of employment; signature and address of physician or official making the medical certificate.

(18) Length of residence (for inmates of hospitals and other institutions; transients or recent residents) at place of death and in the state, together with the place where disease was contracted, if not at place of death, and former or usual residence.

(19) Place of burial or removal; date of burial.

(20) Signature and address of undertaker or person acting as such.

The personal and statistical particulars (items 1 to 13) shall be authenticated by the signature of the informant, who may be any competent person acquainted with the facts.

The statement of facts relating to the disposition of the body shall be signed by the undertaker or person acting as such.

The medical certificate shall be made and signed by the physician, if any, last in attendance on the deceased, who shall specify the time in attendance, the time he last saw the deceased alive, and the hour of the day at which death occurred. And he shall further state the cause of death, so as to show the course of disease or sequence of causes resulting in the death, giving first the name of the disease causing death (primary cause), and the contributory (secondary) cause, if any, and the duration of each. Indefinite and

unsatisfactory terms, denoting only symptoms of disease or conditions resulting from disease, will not be held sufficient for the issuance of a burial or removal permit; and any certificate containing only such terms, as defined by the state registrar, shall be returned to the physician or person making the medical certificate for correction and more definite statement. Causes of death which may be the result of either disease or violence shall be carefully defined; and if from violence, the means of injury shall be stated, and whether (probably) accidental, suicidal, or homicidal. And for deaths in hospitals, institutions, or of nonresidents, the physician shall supply the information required under this head (item 18), if he is able to do so, and may state where, in his opinion, the disease was contracted.

SEC. 8. That in case of any death occurring without medical attendance, it shall be the duty of the undertaker to notify the local registrar of such death, and when so notified the registrar shall, prior to the issuance of the permit, inform the local health officer and refer the case to him for immediate investigation and certification; *provided*, that when the local health officer is not a physician, or when there is no such official, and in such cases only, the registrar is authorized to make the certificate and return from the statement of relatives or other persons having adequate knowledge of the facts; *provided, further*, that if the registrar has reason to believe that the death may have been due to unlawful act or neglect, he shall then refer the case to the coroner or other proper officer for his investigation and certification. And the coroner or other proper officer whose duty it is to hold an inquest on the body of any deceased person, and to make the certificate of death required for a burial permit, shall state in his certificate the name of the disease causing death, or, if from external causes, (1) the means of death; and (2) whether (probably) accidental, suicidal, or homicidal; and shall, in any case, furnish such information as may be required by the state registrar in order properly to classify the death.

SEC. 9. That the undertaker, or person acting as undertaker, shall file the certificate of death with the local registrar of the district in which the death occurred and obtain a burial or removal permit prior to any disposition of the body. He shall obtain the required personal and statistical particulars from the person best qualified to supply them, over the signature and address of his informant. He shall then present the certificate to the attending physician, if any, or to the health officer or coroner, as directed by the local registrar, for the medical certificate of the cause of death and other particulars necessary to complete the record, as specified in sections 7 and 8. And he shall then state the facts required relative to the date and place of burial or removal, over his signature and with his address, and present the completed certificate to the local registrar in order to obtain a permit for burial, removal or other disposition

person in charge, shall sign the burial or removal permit, giving the date of burial, and shall write across the face of the permit the words "No person in charge," and file the burial or removal permit within ten days with the registrar of the district in which the cemetery is located.

SEC. 12. That the birth of each and every child born in this state shall be registered as hereinafter provided.

SEC. 13. That within ten days after the date of each birth, there shall be filed with the local registrar of the district in which the birth occurred a certificate of such birth, which certificate shall be upon the form adopted by the state board of health with a view to procuring a full and accurate report with respect to each item of information enumerated in section 14 of this act.

In each case where a physician, midwife, or person acting as midwife, was in attendance upon the birth, it shall be the duty of such physician, midwife, or person acting as midwife, to file in accordance herewith the certificate herein contemplated.

In each case where there was no physician, midwife, or person acting as midwife, in attendance upon the birth, it shall be the duty of the father or mother of the child, the householder or owner of the premises where the birth occurred, or the manager or superintendent of the public or private institution where the birth occurred, each in the order named, within ten days after the date of such birth, to report to the local registrar the fact of such birth. In such case and in case the physician, midwife, or person acting as midwife, in attendance upon the birth is unable by diligent inquiry to obtain any item or items of information contemplated in section 14 of this act, it shall then be the duty of the local registrar to secure from the person so reporting, or from any other person having the required knowledge, such information as will enable him to prepare the certificate of birth herein contemplated, and it shall be the duty of the person reporting the birth or who may be interrogated in relation thereto to answer correctly and to the best of his knowledge all questions put to him by the local registrar which may be calculated to elicit any information needed to make a complete record of the birth as contemplated by said section 14, and it shall be the duty of the informant as to any statement made in accordance herewith to verify such statement by his signature, when requested so to do by the local registrar.

SEC. 14. That the certificate of birth shall contain the following items, which are hereby declared necessary for the legal, social, and sanitary purposes subserved by registration records:

(1) Place of birth, including state, county, township or town, village or city. If in a city, the ward, street, and house-number; if in a hospital or other institution, the name of the same to be given, instead of the street and house-number.

(2) Full name of child. If the child dies with name, before the certificate is filed, enter the words "unnamed." If the living child has not yet been named, the date of filing certificate of birth, the space for name of child" is to be left blank, to be filled out subsequently by a supplemental report, as hereinafter provided.

(3) Sex of child.

(4) Whether a twin, triplet, or other plural birth. Separate certificate shall be required for each child in case of plural births.

(5) For plural births, number of each child in order of birth.

(6) Whether legitimate or illegitimate.

(7) Date of birth, including the year, month, and day.

(8) Full name of father.

(9) Residence of father.

(10) Color or race of father.

(11) Age of father at last birthday, in years.

(12) Birthplace of father; at least state or foreign country, if known.

(13) Occupation of father. The occupation to be reported if engaged in any remunerative employment, with the statement of (a) trade, profession, or particular kind of (b) general nature of industry, business, or establishment in which employed (or employer).

(14) Maiden name of mother.

(15) Residence of mother.

(16) Color or race of mother.

(17) Age of mother at last birthday, in years.

(18) Birthplace of mother; at least state or foreign country, if known.

(19) Occupation of mother. The occupation to be reported if engaged in any remunerative employment, with the statement of (a) trade, profession, or particular kind of (b) general nature of industry, business, or establishment in which employed (or employer).

(20) Number of children born to this mother, including present birth.

(21) Number of children of this mother living.

(22) The certification of attending physician or midwife as to attendance at birth, including statement of date, month, day (as given in item 7), and hour of birth, whether the child was born alive or stillborn. This certification shall be signed by the attending physician or midwife with date of signature and address; if there is no physician or midwife in attendance, then by the father or mother of the child, householder, owner of the premises, or manager, superintendent of public or private institution where birth occurred, or other competent person, whose duty shall be to notify the local registrar of such birth, as required by section 13 of this act.

(23) Exact date of filing in office of local registrar, attested by his official signature, and registered number of birth, as hereinafter provided.

SEC. 15. That when any certificate of birth of a living child is presented without the statement of the given name, then the local registrar shall make out and deliver to the parents of the child a special blank for the supplemental report of the given name of the child, which shall be filled out as directed, and returned to the local registrar as soon as the child shall have been named.

SEC. 16. That every physician, midwife, and undertaker shall, without delay, register his or her name, address and occupation with the local registrar of the district in which he or she resides, or may hereafter establish a residence; and shall thereupon be supplied by the local registrar with a copy of this act, together with such rules and regulations as may be prepared by the state registrar relative to its enforcement. Within thirty days after the close of each calendar year each local registrar shall make a return to the state registrar of all physicians, midwives, or undertakers who have been registered in his district during the whole or any part of the preceding calendar year; *provided*, that no fee or other compensation shall be charged by local registrars to physicians, midwives, or undertakers for registering their names under this section or making returns thereof to the state registrar.

SEC. 17. That all superintendents or managers, or other persons in charge of hospitals, almshouses, lying-in or other institutions, public or private, to which persons resort for treatment of diseases, confinement, or are committed by process of law, shall make a record of all the personal and statistical particulars relative to the inmates in their institutions at the date of approval of this act, which are required in the forms of the certificates provided for by this act, as directed by the state registrar; and thereafter such record shall be, by them, made for all future inmates at the time of their admittance. And in case of persons admitted or committed for treatment of disease, the physician in charge shall specify, for entry in the record, the nature of the disease, and where, in his opinion, it was contracted. The personal particulars and information required by this section shall be obtained from the individual himself if it is practicable to do so; and when they cannot be so obtained, they shall be obtained in as complete a manner as possible from relatives, friends, or other persons acquainted with the facts.

SEC. 18. That the state registrar shall prepare, print, and supply to all registrars all blanks and forms used in registering, recording, and preserving the returns, or in otherwise carrying out the purposes of this act; and shall prepare and issue such detailed instructions as may be required to procure the uniform observance of its provisions and the maintenance of a perfect system of registration; and no

other blanks shall be used than those supplied by the state registrar. He shall carefully examine the certificates received monthly from the local registrars, and if any such are incomplete or unsatisfactory he shall require such further information to be supplied as may be necessary to make the record complete and satisfactory. And all physicians, midwives, informants, or undertakers, and all other persons having knowledge of the facts, are hereby required to supply upon a form provided by the state registrar, or upon the original certificate, such information as they may possess regarding any birth or death upon demand of the state registrar, in person, by mail, or through the local registrar; *provided*, that no certificate of birth or death, after its acceptance for registration by the local registrar, and no other record made in pursuance of this act, shall be altered or changed in any respect otherwise than by amendments properly dated, signed, and witnessed. The state registrar shall further arrange, bind, and permanently preserve the certificates in a systematic manner, and shall prepare and maintain a comprehensive and continuous card-index of all births and deaths registered; said index to be arranged alphabetically, in the case of deaths, by the names of decedents, and in the case of births, by the names of fathers and mothers. He shall inform all registrars what diseases are to be considered infectious, contagious, or communicable and dangerous to the public health, as decided by the state board of health, in order that when deaths occur from such diseases proper precautions may be taken to prevent their spread.

If any cemetery company or association, or any church or historical society or association, or any other company, society or association, or any individual, is in possession of any record of births or deaths which may be of value in establishing the genealogy of any resident of this state, such company, society, association, or individual may file such record or a duly authenticated transcript thereof with the state registrar, and it shall be the duty of the state registrar to preserve such record or transcript and to make a record and index thereof in such form as to facilitate the finding of any information contained therein. Such record and index shall be open to inspection by the public, subject to such reasonable conditions as the state registrar may prescribe. If any person desires a transcript of any record filed in accordance herewith, the state registrar shall furnish the same upon application, together with the certificate that it is a true copy of such record as filed in his office, and for his services in so furnishing such transcript and certificate he shall be entitled to a fee of ten cents per folio (fifty cents per hour or fraction of an hour necessarily consumed in making such transcript), and to a fee of twenty-five cents for the certificate, which fees shall be paid by the applicant.

SEC. 19. That each local registrar shall supply blank forms of certificates to such persons as require them. Each local registrar shall carefully examine each certificate of

birth or death when presented for record in order to ascertain whether or not it has been made out in accordance with the provisions of this act and the instructions of the state registrar; and if any certificate of death is incomplete or unsatisfactory, it shall be his duty to call attention to the defects in the return, and to withhold the burial or removal permit until such defects are corrected. All certificates, either of birth or of death, shall be written legibly, in durable black ink, and no certificate shall be held to be complete and correct that does not supply all of the items of information called for therein, or satisfactorily account for their omission. If the certificate of death is properly executed and complete, he shall then issue a burial or removal permit to the undertaker; *provided*, that in case the death occurred from some disease which is held by the state board of health to be infectious, contagious, or communicable and dangerous to the public health, no permit for the removal or other disposition of the body shall be issued by the registrar, except under such conditions as may be prescribed by the state board of health. If a certificate of birth is incomplete, the local registrar shall immediately notify the informant, and require him to supply the missing items of information if they can be obtained. He shall number consecutively the certificates of birth and death, in two separate series, beginning with number 1 for the first birth and the first death in each calendar year, and sign his name as registrar in attest of the date of filing in his office. He shall also make a complete and accurate copy of each birth and each death certificate registered by him in a record-book supplied by the state registrar, to be preserved permanently in his office as the local record, in such manner as directed by the state registrar. And he shall, on the tenth day of each month, transmit to the state registrar all original certificates registered by him for the preceding month. And if no births or no deaths occurred in any month, he shall, on the tenth day of the following month, report that fact to the state registrar, on a card provided for such purpose.

SEC. 20. That each local registrar shall be paid the sum of twenty-five cents for each birth certificate and each death certificate properly and completely made out and registered with him, and correctly recorded and promptly returned by him to the state registrar, as required by this act. And in case no births or no deaths were registered during any month, the local registrar shall be entitled to be paid the sum of twenty-five cents for each report to that effect, but only if such report be made promptly as required by this act. All amounts payable to the local registrar under the provisions of this section shall be paid by the treasurer of the county in which the registration district is located, upon certification by the state registrar. And the state registrar shall annually certify to the treasurers of the several counties the number of births and deaths properly registered,

SEC. 21. That the state registrar shall, upon request, supply to any applicant a certified copy of the record of any birth or death registered under provisions of this act, for the making and certification of which he shall be entitled to a fee of fifty cents, to be paid by the applicant. And any such copy of the record of a birth or death, when properly certified by the state registrar, shall be prima facie evidence in all courts and places of the facts therein stated. For any search of the files and records when no certified copy is made, the state registrar shall be entitled to a fee of fifty cents for each hour or fractional part of an hour of time of search, said fee to be paid by the applicant. And the state registrar shall keep a true and correct account of all fees by him received under these provisions, and turn the same over to the state treasurer; *provided*, that the state registrar shall, upon request of any parent or guardian, supply without fee, a certificate limited to a statement as to the date of birth of any child when the same shall be necessary for admission to school, or for the purpose of securing employment; *and provided further*, that the United States Census Bureau may obtain, without expense to the state, transcripts or certified copies of births and deaths without payment of the fees herein prescribed.

SEC. 22. That any person, who for himself or as an officer, agent, or employee of any other person, or of any corporation or partnership (a) shall inter, cremate, or otherwise finally dispose of the dead body of a human being, or permit the same to be done, or shall remove said body from the primary registration district in which the death occurred or the body was found, without the authority of a burial or removal permit issued by the local registrar of the district in which the death occurred or in which the body was found; or (b) shall refuse or fail to furnish correctly any information in his possession, or shall furnish false information affecting any certificate or record, required by this act; or (c) shall wilfully alter, otherwise than is provided by section 18 of this act, or shall falsify any certificate of birth or death, or any record established by this act; or (d) being required by this act to fill out a certificate of birth or death and file the same with the local registrar, or deliver it, upon request, to any person charged with the duty of filing the same, shall fail, neglect, or refuse to perform such duty in the manner required by this act; or (e) being a local registrar, or subregistrar, shall fail, neglect, or refuse to perform his duty as required by this act and by the instructions and direction of the state registrar thereunder, shall be deemed guilty of a misdemeanor, and upon conviction thereof shall for the first offense be fined not less than five dollars (\$5) nor more than fifty dollars (\$50), and for each subsequent offense not less than ten dollars (\$10) nor more than one

hundred dollars (\$100), or be imprisoned in the county jail not more than sixty days, or be both fined and imprisoned in the discretion of the court.

SEC. 23. That each local registrar is hereby charged with the strict and thorough enforcement of the provisions of this act in his registration district, under the supervision and direction of the state registrar. And he shall make an immediate report to the state registrar of any violation of this law coming to his knowledge, by observation or upon complaint of any person, or otherwise.

The state registrar is hereby charged with the thorough and efficient execution of the provisions of this act in every part of the state, and is hereby granted supervisory power over local registrars, deputy local registrars, and subregistrars, to the end that all of its requirements shall be uniformly complied with. The state registrar, either personally or by an accredited representative, shall have authority to investigate cases of irregularity or violation of law, and all registrars shall aid him, upon request, in such investigations. When he shall deem it necessary, he shall report cases of violation of any of the provisions of this act to the prosecuting attorney of the county, with a statement of the facts and circumstances; and when any such case is reported to him by the state registrar, the prosecuting attorney shall forthwith initiate and promptly follow up the necessary court proceedings against the person or corporation responsible for the alleged violation of law. And, upon request of the state registrar, the attorney-general shall assist in the enforcement of the provisions of this act.

MARRIAGE LICENSES

The following list shows the number of marriage licenses issued by the County Clerks of the several counties in the State from January 1 to December 31, 1920, inclusive:

Churchill County.....	61
Clark County.....	50
Douglas County.....	23
Elko County.....	86
Esmeralda County.....	24
Eureka County.....	11
Humboldt County.....	46
Lander County.....	4
Lincoln County.....	24
Lyon County.....	39
Mineral County.....	16
Nye County.....	51
Ormsby County.....	46
Pershing County.....	32
Storey County.....	13
Washoe County.....	541
White Pine County.....	89
Total.....	1156

LOCAL HEALTH OFFICERS OF THE STATE OF NEVADA

Churchill County.....	Dr. E. F. Derby.....	Fallon.
Clark County.....	Dr. Hal L. Hewetson.....	Las Vegas.
Douglas County.....	Dr. W. L. Howell.....	Gardnerville.
Elko County.....	Dr. John E. Worden.....	Elko.
Esmeralda County.....	Dr. J. L. McCarthy.....	Goldfield.
Eureka County.....	Dr. W. H. Brennen.....	Eureka.
Humboldt County.....	Dr. E. D. Giroux.....	Winnemucca.
Lander County.....	Dr. G. L. Belanger.....	Austin.
Lincoln County.....	Dr. J. H. Hastings.....	Ploche.
Lyon County.....	Dr. Geo. E. Leavitt.....	Yerington.
Mineral County.....	Dr. J. W. Davis.....	Hawthorne.
Nye County.....	Dr. C. J. Richards.....	Tonopah.
Ormsby County.....	Dr. S. S. Jarrett.....	Carson City.
Pershing County.....	Dr. E. K. Smith.....	Lovelock.
Storey County.....	Dr. Fred W. Hodgins.....	Virginia City.
Washoe County.....	Dr. W. L. Kistler.....	Sparks.
White Pine County.....	Dr. L. T. Brock.....	Ely.

LICENSED EMBALMERS OF THE STATE OF NEVADA**State Board of Embalmers**

J. L. KEYSER, <i>President</i>	Elko.
T. F. DUNN, <i>Treasurer</i>	Goldfield.
GEO. E. KIZTMEYER, <i>Secretary</i>	Carson City.

Members

Bates, O. G.....	Ely.
Burke, J. J.....	Reno.
Cavanaugh, Frank.....	Tonopah.
Clock, H. E.....	Reno.
Circe, W. J. (U. S. A.).....	Carson City.
Carlson, Perry.....	Winnemucca.
Dunn, Thos. F.....	Goldfield.
Dunn, Frank T.....	Tonopah.
Deck, J. H.....	Pioche.
Downey, W. J.....	Carson City.
Evans, Wallace N.....	Carson City.
Foster, Mrs. Edna T.....	Lovelock.
Gallagher, John.....	Lovelock.
Groesbeck, P. E.....	Reno.
Gulling, John.....	Winnemucca.
Gill, Miss Hazel.....	Goldfield.
Glover, W. H.....	Elko.
Hjul, Chas. C. H.....	Eureka.
Keyser, Jos. L.....	Elko.
Kenny, Jos. B.....	Virginia City.
Kearns, H. A.....	Austin.
Kaiser, W. F.....	Fallon.
Guenet, Joseph.....	La Habre, Calif.
Horswill, E. R.....	Ely.
Keyser, J. H.....	Elko.
Kitzmeyer, Geo. E.....	Carson City.
Moody, J. F.....	Quincy, Calif.
Morrison, G. Edwin (U. S. A.).....	San Antonio, Texas.
Noone, John H.....	Tonopah.
Ocker, Chas. A.....	Truckee, Calif.
O'Brien, J. B.....	Reno.
Phipps, Alexander S.....	Yerington.
Patten, T. M.....	Winnemucca.
Roe, H. E.....	Fallon.
Rogers, Thos. D.....	Manhattan.
Robbins, J. E.....	Elko.
Ross, Silas E.....	Reno.
Roberts, William I.....	Las Vegas.
Smith, Mrs. Lottie.....	Oakland, Calif.

CAUSES OF DEATH (International Classification)

From January 1 to December 31, 1919

GENERAL DISEASES

Typhoid fever	6
Whooping-cough	5
Influenza	26
Diphtheria	1
Erysipelas	2
Purulent infection and septicemia	21

TUBERCULOSIS

Tuberculosis of the lungs.....	46
Acute miliary tuberculosis.....	2
Tuberculosis meningitis	7
Tuberculosis of other organs.....	2
Pneumokoniosis (miner's consumption).....	6
Syphilis	3

CANCER (TOTAL)

Cancer of the buccal cavity.....	2
Cancer of the stomach and liver.....	25
Cancer of the peritoneum, intestines, rectum.....	3
Cancer of the female genital organs.....	4
Cancer of the breast.....	3
Cancer of other unspecified organs.....	16
Other tumors (except of female genital organs).....	1
Diabetes	6
Pernicious anemia	4
Alcoholism	1

DISEASES OF THE NERVOUS SYSTEM

Simple meningitis	1
Cerebrospinal meningitis	3
Locomotor ataxia	1
Cerebral hemorrhage, apoplexy.....	46
Softening of the brain.....	7
Paralysis without specified cause.....	9
General paralysis of the insane.....	4
Other forms of mental alienation.....	2
Epilepsy	2
Convulsions of infants.....	5

DISEASES OF THE CIRCULATORY SYSTEM

Pericarditis	3
Acute endocarditis	8
Organic disease of the heart.....	80
Angina pectoris	10
Disease of arteries, atheroma, aneurism, etc.....	12
Embolism and thrombosis.....	7
Hemorrhage; other diseases of the circulatory system.....	9

DISEASES OF THE RESPIRATORY SYSTEM

Acute bronchitis	2
Chronic bronchitis	3
Bronchopneumonia	62
Lobar pneumonia	51
Pneumonia (undefined).....	133
Pulmonary congestion, pulmonary apoplexy.....	2
Gangrene of the lungs.....	1
Asthma	2
Pulmonary emphysema	3

DISEASES OF THE DIGESTIVE SYSTEM

Ulcer of the stomach.....	2
Other diseases of the stomach (cancer excepted).....	2
Diarrhea and enteritis (under 2 years).....	9
Diarrhea and enteritis (2 years and over).....	5

Appendicitis and typhlitis.....	9
Hernias	2
Intestinal obstructions	10
Other diseases of the intestines.....	3
Cirrhosis of the liver.....	6
Biliary calculi	3
Other diseases of the liver.....	3
Simple peritonitis (nonpuerperal).....	3

DISEASES OF THE GENITO-URINARY SYSTEM

Acute nephritis	2
Bright's disease	30
Calculi of the urinary passages.....	1
Uterine tumor (noncancerous).....	1

PUERPERAL STATE

Other accidents of labor.....	1
Puerperal septicemia	2
Puerperal albuminaria and convulsions.....	1
Following childbirth (not otherwise specified).....	2

DISEASES OF THE SKIN

Gangrene	2
Acute abscess	1

MALFORMATIONS

Hydrocephalus	1
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DISEASES OF EARLY INFANCY

Premature birth	23
Congenital debility, atrophy, marasmus, etc.....	21
Stillbirths	36

OLD AGE

Senility	31
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AFFECTIONS PRODUCED BY EXTERNAL CAUSES

Suicide by poison.....	8
Suicide by hanging or strangulation.....	2
Suicide by firearms.....	7
Suicide by piercing or cutting instruments.....	5
Suicide by jumping from a high place.....	2
Other suicides	3
Poisoning by food.....	1
Other acute poisonings.....	2
Conflagration	2
Burns (conflagration excepted).....	8
Accidental drowning	7
Traumatism by firearms.....	8
Traumatism by fall.....	5
Traumatism in mines and quarries.....	20
Traumatism by machines.....	5
Railroad accidents and injuries.....	13
Automobile accidents and injuries.....	8
Landslide, other crushing.....	2
Injuries by animals.....	1
Starvation	2
Electricity (lightning excepted).....	3
Homicide by firearms.....	11
Homicides by other means.....	4
Fractures (cause not specified).....	3

ILL-DEFINED DISEASES

Cause of death ill defined.....	16
Cause of death not specified, or unknown.....	10
Sudden death	2

Total.....	1044
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33.	2	2	1
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DEATHS ACCORDING TO AGE, SEX, COLOR, NATIVITY, AND SOCIAL CONDITION
For the Year Ending December 31, 1919

Counties	Important ages													Males	Females	White	Colored	Native	Foreign	Unknown	Single	Married	Widowed	Divorced	Unknown						
	Under 1 year	1 to 5 years	5 to 10 years	10 to 20 years	20 to 30 years	30 to 40 years	40 to 50 years	50 to 60 years	60 to 70 years	70 to 80 years	80 to 90 years	90 to 100 yrs.	100 yrs. and over													Unknown	Stillbirths				
Churchill	6	1	2	4	5	6	6	4	5	2	3	1			3	8	21	12	93		29	8	1	11	13	8			1		
Clark	3			2	4	5	6	10	3	2	2	1				3	35	35	12	88	16	23	12	16	16	2		2		9	
Douglas	2			7	6	6	6	6	3	3	3	4				3	15	15	12	24	9	16	12	12	8					1	
Elko	11	4	1	5	8	8	8	9	3	3	3	1				3	66	27	68	47	7	66	2	38	23	7	3			7	
Esmeralda	4	2	1	6	6	6	6	6	6	6	6	1				3	27	16	47	17	1	27	6	19	13	9	1			3	
Eureka	2			3	3	3	3	3	3	3	3	1				1	7	37	14	37	4	37	10	12	4	1					8
Humboldt	3	1	1	4	5	5	5	5	5	5	5	1				1	14	13	46	18	4	10	3	19	20	8					3
Lincoln	3	2	1	4	4	4	4	2	3	4	4	3				2	14	6	23	18	4	18	6	13	2	3		1			2
Lander	7	3	1	4	4	4	4	4	5	2	2	3				1	20	7	23	23	4	30	31	27	20	4	4	1			1
Lyon	3	1	1	4	4	4	4	4	4	4	4	3				2	14	6	20	8	3	14	9	14	4	4	8				4
Minderal	1	6	1	8	8	8	8	4	6	6	6	2				1	65	23	86	2	51	34	8	89	84	8	2	3			3
Ormsby	2	1	2	5	5	5	5	9	8	12	9	4				42	28	53	17	89	22	89	32	32	24	12	2	2			2
Perth	1	2	2	4	4	4	4	2	1	3	11	3				9	16	14	30	6	2	17	4	6	3	3	3				3
Storey	2	1	1	4	4	4	4	1	3	11	3	3				1	16	14	90	12	9	17	1	1	7	12	1	1			2
Washoe	20	10	7	32	38	43	43	43	20	43	20	1				194	135	18	808	13	218	99	2	117	124	55	8	6	1		15
White Pine	3	3	1	12	12	12	12	12	17	7	2	2				11					10	63	27	8	44	26	8				16
Totals	90	34	13	31	95	165	122	118	124	128	67	4	1		11	36	691	353	965	79	663	332	49	441	345	164	23				66

**CONTAGIOUS, INFECTIOUS AND COMMUNICABLE DISEASES REPORTED BY THE LOCAL HEALTH OFFICERS
For the Year Ending December 31, 1919**

Counties	Scarlet fever		Small-pox		Diphtheria and membranous group		Typhoid fever		Whooping cough		Measles		Mumps		Chick-enpox		Pneu-monia		Tuber-culosis		Bron-chitis		Cere-bro-spinal menin-gitis		Diar-rheal diseases of chil-dren		Cancer		Puer-peral septi-cemia		Rocky Moun-tain spotted (tick) fever		
	C ^a	D ^b	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	
Churchill	4	0	2	0	---	---	4	0	---	---	---	---	---	---	---	---	7	8	4	4	1	---	---	---	2	2	3	1	---	---	---	---	
Clark	170	---	---	---	1	1	1	0	---	---	---	---	---	---	1	0	9	6	1	1	1	---	---	---	---	---	---	---	---	---	---	---	
Douglas	---	---	---	---	1	0	---	---	---	---	4	0	---	---	---	---	13	6	1	1	---	---	---	---	---	---	---	---	---	---	---	---	
Elko	1	0	3	0	---	---	2	1	5	1	5	0	4	0	---	---	21	18	3	8	---	---	---	---	---	---	---	---	---	---	---	---	
Esmeralda	---	---	---	---	1	1	---	---	---	---	---	---	---	---	---	---	11	11	2	2	---	---	---	---	---	---	---	---	---	---	---	---	
Eureka	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1	0	8	6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Humboldt	---	---	---	---	---	---	2	1	---	---	---	---	---	---	---	---	19	13	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Lander	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2	1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Lincoln	---	---	---	---	---	---	2	0	2	2	---	---	---	---	---	---	52	21	1	1	2	---	---	---	---	---	---	---	---	---	---	---	---
Lyon	---	---	---	---	---	---	---	---	---	---	5	5	---	---	---	---	6	6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Mineral	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	50	38	7	7	1	---	---	---	---	---	---	---	---	---	---	---	---
Nye	---	---	1	0	---	---	---	---	---	---	---	---	---	---	---	---	20	15	4	4	1	0	---	---	---	---	---	---	---	---	---	---	---
Ormsby	3	0	---	---	---	---	2	1	1	1	0	0	22	0	2	0	2	2	2	2	---	---	---	---	---	---	---	---	---	---	---	---	---
Perahing	---	---	---	---	---	---	---	---	---	---	4	0	---	---	---	---	2	2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Storey	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	15	8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Washoe	13	0	8	0	2	0	36	2	30	1	23	0	2	0	8	0	90	77	12	12	8	2	1	1	1	1	0	24	3	2	1	0	
White Pine	23	0	75	0	---	---	7	0	5	0	10	0	2	0	34	0	20	11	27	10	128	1	---	---	21	0	8	7	---	---	---	---	
Totals	47	0	89	0	3	1	47	6	43	5	46	0	32	0	48	0	354	251	65	48	134	5	4	3	28	6	69	3	2	2	0	7	

^aCases.

^bDeaths.

CAUSES OF DEATH (International Classification)
From January 1 to December 31, 1920

GENERAL DISEASES

Typhoid fever	9
Malaria	1
Measles	3
Whooping-cough	13
Influenza	33
Erysipelas	2
Purulent infection and septicemia	13
Anthrax	1
Rocky Mountain spotted (tick) fever	1

TUBERCULOSIS

Tuberculosis of the lungs	63
Acute miliary tuberculosis	1
Tuberculosis meningitis	4
Pneumokoniosis	6
Tuberculosis of other organs	5
Syphilis	11

CANCER (TOTAL)

Cancer of the buccal cavity	2
Cancer of the stomach, liver	30
Cancer of the peritoneum, intestines, rectum	3
Cancer of the female genital organs	8
Cancer of the breast	2
Cancer of other or unspecified organs	7
Diabetes	7
Exophthalmic goitre	1
Addison's disease	1
Anemia, chlorosis	1
Pernicious anemia	3
Alcoholism (acute)	1
Hodgkin's disease	2

DISEASES OF THE NERVOUS SYSTEM

Encephalitis	2
Simple meningitis	8
Cerebrospinal meningitis	2
Locomotor ataxia	1
Cerebral hemorrhage, apoplexy	32
Softening of the brain	2
Paralysis without specific cause	2
General paralysis of the insane	1
Other forms of mental alienation	5
Epilepsy	1
Convulsions (nonpuerperal)	2
Convulsions of infants	1

DISEASES OF THE CIRCULATORY SYSTEM

Pericarditis	1
Acute endocarditis	7
Organic disease of the heart	72
Angina pectoris	7
Diseases of the arteries, atheroma, aneurism, etc.	12
Embolism and thrombosis	6
Hemorrhage; other diseases of circulatory system	6

DISEASES OF THE RESPIRATORY SYSTEM

Acute bronchitis	2
Chronic bronchitis	2
Bronchopneumonia	56
Lobar pneumonia	32
Pneumonia (undefined)	60
Pleurisy	1
Pulmonary congestion, pulmonary apoplexy	3
Asthma	6

Other diseases of the stomach (cancer excepted).....	3
Diarrhea and enteritis (under 2 years).....	18
Diarrhea and enteritis (2 years and over).....	3
Appendicitis and typhlitis.....	5
Hernias	4
Intestinal obstructions	13
Other diseases of the intestines.....	2
Cirrhosis of the liver.....	2
Other diseases of the liver.....	3
Simple peritonitis (nonpuerperal).....	13

DISEASES OF GENITO-URINARY SYSTEM

Acute nephritis	12
Bright's disease	32
Other diseases of the kidneys and annexa.....	1
Calculi of the urinary passages.....	1
Diseases of the prostate.....	3
Urinary tumor (noncancerous).....	2

PUERPERAL STATE

Accidents of pregnancy.....	3
Puerperal hemorrhage	1
Puerperal septicemia	1
Puerperal albuminaria and convulsions.....	1

DISEASES OF THE SKIN

Gangrene	3
Acute abscess	2

DISEASES OF EARLY INFANCY

Premature birth	16
Congenital debility, "atrophy," marasmus, etc.....	17
Stillbirths	35

OLD AGE

Senility	21
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AFFECTIONS PRODUCED BY EXTERNAL CAUSES

Suicide by poison.....	1
Suicide by hanging or strangulation.....	3
Other suicides	9
Suicide by firearms.....	9
Suicide by cutting or piercing instruments.....	3
Poisoning by food.....	2
Poisoning by wood alcohol.....	2
Other acute poisoning.....	1
Conflagration	1
Burns (conflagration excepted).....	1
Accidental drowning	3
Traumatism by firearms.....	1
Traumatism by fall.....	3
Traumatism in mines and quarries.....	13
Railroad accidents and injuries.....	7
Injuries by other vehicles.....	1
Automobile accidents and injuries.....	9
Injuries by animals.....	3
Homicide by firearms.....	12
Homicide by other means.....	1
Fractures (cause not specified).....	4

ILL-DEFINED DISEASES

Cause of death ill defined.....	16
Cause of death not specified, or unknown.....	9
Ill-defined organic disease.....	2
Sudden death	1

Total deaths exclusive of stillbirths.....	869
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DEATHS ACCORDING TO AGE, SEX, COLOR, NATIVITY, AND SOCIAL CONDITION
For the Year Ending December 31, 1920

Counties	Important ages													Males	Females	White	Colored	Native	Foreign	Unknown	Single	Married	Widowed			
	Under 1 year.	1 to 5 years.....	5 to 10 years...	10 to 20 years..	20 to 30 years..	30 to 40 years..	40 to 50 years..	50 to 60 years..	60 to 70 years..	70 to 80 years..	80 to 90 years..	90 to 100 yrs....	100 yrs. and over.....											Unknown	Stillbirths	
Churchill	4	4	2	2	6	3	5	5	6	3	2	1	1		1	24	14	37	1	29	6	3	16	13	6	110
Clark	13	13			4	3	3	2	10	2	2	1			3	27	23	46	4	41	5	4	23	15	5	326
Douglas	1	3	4	5	9	9	1	6	3	4	4		1	1		51	24	62	10	57	12	6	23	15	2	15
Eiko	2	1	1	1	2	2	1	4	6	5	5					15	10	23	13	19	7	2	9	10	6	4
Esmeralda	4	4	2	1	4	6	3	2	4	7	1				3	14	18	39	6	9	11	1	11	12	4	4
Eureka	11	2	2	1	1	6	3	6	3	2	3				7	27	18	38	34	12	10	2	12	10	1	1
Humboldt	2	2	1	1	1	1	3	3	3	3	3				8	12	16	18	12	4	4	4	10	10	1	1
Lander	2	2			7	7	2	2	6	5	4				2	11	18	23	2	11	12	1	14	11	1	1
Lincoln	6	1		1	2	6	3	2	1	5	4				1	18	14	31	1	18	10	1	14	11	1	1
Lyon	1	2			16	4	4	2	7	14	6				8	3	10	16	6	5	2	2	6	1	1	1
Mineral	1	4	2	2	9	11	1	1	10	4	3				2	65	15	76	4	42	30	8	43	26	1	1
Nye	3	3		5	1	6	4	6	4	4	4				4	21	18	27	12	25	14	1	19	15	5	5
Ormsby	3	4		2	2	6	2	3	4	3	1				4	16	9	23	3	15	9	1	9	13	2	2
Pershing	1				2	1	2	2	7	9	4				1	16	14	30	11	19	14	1	8	11	9	9
Storey	1	1	1	10	14	37	38	44	40	36	15	2			1	16	14	30	14	190	85	7	115	108	34	7
Washoe	22	5	3	9	16	8	8	9	7	9	4				8	196	87	268	14	190	68	19	8	44	138	7
White Pine	14	5	1												1	63	82	87	8	68	19	8	44	138	34	7
Totals	111	30	21	31	64	125	92	120	122	107	49	3	1	3	35	596	306	835	69	591	254	49	405	326	110	7

CONTAGIOUS, INFECTIOUS AND COMMUNICABLE DISEASES REPORTED BY THE LOCAL HEALTH OFFICERS
For the Year Ending December 31, 1920

Counties	Scarlet fever		Small-pox		Diphtheria and membranous croup		Typhoid fever		Whooping cough		Measles		Mumps		Chickenpox		Pneumonia		Tuberculosis		Bronchitis		Cerebro-spinal meningitis		Diarrheal diseases of children		Cancer		Puer-peral septi-cemia		Rocky Mountain spotted (tick) fever		Influenza	
	O ^a	D ^b	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D		
Churchill	1	0	10	0							45	0			4	0	11	6	4	3							4	3			15	1		
Clark	1	0	45	0	1	0	32	1	3	0	3	0			1	0	7	3	3	3							1	1			63	3		
Douglas	2	0							19	0	90	0	39	0	2	0	16	1	1	1							1	1			58	1		
Elko	4	0	6	0					17	0	45	0	4	0			12	4	1	1							2	3			44	2		
Esmeralda									10	0	15	0					2	2	3	3							1	1						
Eureka									3	3							4	4	1	1							2	2			525	4		
Flamboldt									2	0							4	2	4	2							1	1			34	1		
Harvey			3	0					15	0							4	4	4	4											121	1		
Lincoln			4	0							25	0	80	0			10	4	4	4														
Lyon	1	0	4	0													4	4	4	4														
Mineral																	13	12	12	12											96	3		
Nye	4	0	13	0					25	1	2	1	2	0	1	0	4	4	5	5								2	3			7	0	
Ormsby																	3	3	3	3											5	0		
Pershing	1	0	3	0													8	8	1	1											5	0		
Storey									114	2	70	1			15	0	3	3	1	1											1	1		
Washoe	24	0	221	0	4	1	13	1	69	2	223	1	9	0	26	0	65	51	14	13							3	3			103	1		
White Pine	17	0	15	0	1	0	2	1	44	2	66	0	2	0	37	0	52	26	6	6							17	17	1	1	343	12		
Totals	55	0	321	0	6	0	35	9	336	13	537	3	56	0	86	0	212	148	67	63	90	4	3	2	21	18	52	52	1	1	1430	38		

^aC—Cases.^bD—Deaths.



STATE OF NEVADA

BIENNIAL REPORT

OF THE

STATE LIBRARY COMMISSION

1919-1920



CARSON CITY, NEVADA

STATE PRINTING OFFICE : : : JOE FARNSWORTH, SUPERINTENDENT
1921

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NEVADA STATE LIBRARY

LIBRARY COMMISSION

HON. B. W. COLEMAN.....	Chief Justice
HON. J. A. SANDERS.....	Associate Justice
HON. E. A. DUCKER.....	Associate Justice

OFFICERS

FRANK J. PYNE.....	Librarian
MAUDE H. GILLSON.....	Assistant Librarian
WILLIAM KENNETT	Secretary

LETTER OF TRANSMITTAL

CARSON CITY, NEVADA, December 30, 1920.

To His Excellency, EMMET D. BOYLE, Governor of Nevada.

SIR: The State Library Commission has the honor to present herewith its third biennial report for the years 1919-1920.

For detailed information regarding the Library, you are referred to the report of the State Librarian, hereto annexed.

STATE LIBRARY COMMISSION,

B. W. COLEMAN, *Chief Justice,*
J. A. SANDERS, *Associate Justice,*
E. A. DUCKER, *Associate Justice.*

RULES OF THE NEVADA STATE LIBRARY

The Library is open to every citizen in the State.

The Library hours are from 9 to 12, 1 to 5, and 6 to 9.

Persons borrowing books are responsible in every way for same.

One book may be taken from the library and retained for a period of two weeks, and may be renewed for an additional week.

Persons borrowing books by post or express in different parts of the State may retain such books for four weeks, but cannot have them renewed. *Stats. 1917, p. 347.*

A book cannot be transferred from one account to another unless returned to the Library.

A book retained a week beyond the time limit may be sent for at the expense of the delinquent.

A fine of two cents a day is assessed on each book retained overtime, and another book cannot be withdrawn until fine is paid.

A fine of ten cents a day is assessed on each book retained overtime by persons borrowing books by post or express. *Stats. 1917, p. 317.*

The Library pays the carriage on all books sent to borrowers by post or express, they to pay return charges.

No book of reference, such as magazines, newspapers, encyclopedias, dictionaries, or indexes, can be taken from the Library.

Any person mutilating or defacing a library volume is immediately deprived of all rights of further use of the Library.

Any person refusing to pay the fines or expenses mentioned, forfeits all rights to the use of the Library.

FRANK J. PYNE,
State Librarian.

REPORT OF STATE LIBRARIAN

To the Honorable Board of Library Commissioners, Nevada State Library.

GENTLEMEN: The State Librarian begs to submit the biennial report of the Nevada State Library, covering the time from January 1, 1919, to January 1, 1921, under the management of the Library Commission.

During the last two years the growth of the Library has been much greater than the preceding years, owing to conditions before and during the war, and the much greater use being made of the miscellaneous library by the schools and the citizens of the State.

During this period there has been added to this valuable collection nine thousand three hundred and seventy-three (9,373) volumes. Two thousand six hundred and ninety-two (2,692) were added to the law department; five thousand six hundred and thirty-seven (5,637) to the general literature department, and one thousand and forty-four (1,044) were accessioned to the document department. This brings the total collection in the Library to ninety-one thousand three hundred and nine (91,309) volumes, twenty-seven volumes having been lost or worn out during this period.

LAW DEPARTMENT

During the years 1919-1920 I succeeded in purchasing a few volumes of American Reports that were missing in our valuable collection. These volumes appear on the market at rare intervals, and are so scarce they must be purchased when offered or they find their way into other large libraries, and do not appear again. We also purchased all the standard law text-books published, and have kept up to date with the reporter system, the reports of the different States, and the miscellaneous sets of American Reports that go to make a complete law library. We also added to our collection many volumes of English and Colonial Reports to help fill in our nearly complete sets, some of them being as follows: Crockford Maritime Cases, 3 volumes; Rolls of Parliament, 6 volumes; Stillingfleet's Reports, 2 volumes; Notes of Cases in Ecclesiastical and Maritime Courts, 7 volumes; Macassey, Olliver, Bell and Fitzjerald Reports, and a set of the Seldon Society Publications, 35 volumes.

Also many volumes of law classics have been added to the collection, comprising legal essays, biographies, trials and reminiscences of lawyers. These books treat on the history of the law, and show splendid examples of early printing and binding.

LEGAL PERIODICALS

We have added to our large collection of law periodicals the following complete sets: New Jersey Law Journal, 42 volumes, and the Philadelphia Legal Intelligence, 76 volumes, besides many single volumes to fill in the broken sets. These publications are the scarcest legal material on the market, and the six thousand three hundred (6,300) volumes that the Library possesses show a wonderful yearly increase in value.

STATUTE LAW

The statute law collection of the Library is recognized as one of the finest in the United States, we being one of the first States in the Union to start a systematic collection of this material, and thereby getting the cream of the laws of this country. We added about 80 volumes to the collection during this time.

CLASSIFICATION

During the two years all the two thousand six hundred and ninety-two (2,692) volumes received in the Law Department have been accessioned, classified and catalogued. A total of nine thousand two hundred (9,200) cards have been written and placed under their special author and subject-headings. The total number of reports, statutes, law journals and text-books in the law library is thirty-six thousand four hundred and sixty (36,460) volumes.

GENERAL LITERATURE DEPARTMENT

The General Literature Department of the State Library now accessions thirty thousand one hundred and eleven (30,111) volumes of biography, education, religion, mining, geology, agriculture, medicine, poetry, drama, travel and history, together with thousands of bound magazines, newspapers and general reference books. Quite a few of the best books have been added to the Fiction and Children's Department. All of these books have been accessioned and placed upon the shelves, and cards for same have been received from the Library of Congress and placed in the card catalog. A total of twenty-two thousand five hundred and forty-eight (22,548) cards have been added to our catalog.

MAGAZINES AND NEWSPAPERS

The Library subscribes for one hundred and sixty (160) of the best reference magazines on law and miscellaneous subjects, together with most of the newspapers published in the State. These are bound at the end of every year, placed on the shelves, added to our collection, and become part of our permanent files.

CIRCULATION

The Circulating Library now has on its register twenty-three hundred and ninety-seven (2,397) book borrowers from all parts of the State. This is an increase of one thousand and ninety-seven (1,097) over the last two years. The increase in circulation throughout the State and from the different school districts became so great that the Library Commission had to place another assistant in charge of this department to take care of that part of the work. The total circulation in this department has been over 40,000.

PUBLIC DOCUMENTS

All documents received from the Government and the different States have been accessioned and classified according to government check lists. These totalled one thousand and forty-four (1,044) volumes, bringing the total number of volumes in this department to 24,765.

LEGISLATIVE REFERENCE BUREAU

Nearly every State in the Union has established what the Legislative Reference Bureau. This bureau is for of collecting and making available information for the when in session, the several State Departments in the their duties, and to serve such other citizens as may desire the same. The Library has a remarkable collection of t scattered throughout the three floors of the Library Build arrangement should be made to collect, classify, arrange these books, pamphlets, and material so that the inform moment's notice, could be placed before the person desiri

IMPROVEMENTS

The State Library Commission had the exterior of t Building painted white to conform to the State Capitol Buil was painted at the same time. A few wooden shelves wer the Miscellaneous Department of the Library, to take c accumulation in that department. This department has n its full book capacity in regard to absorbing the books and coming into the Library. If there is to be no appropriation the Nevada Heroes' Memorial Building to take care of Library, permission should be given the State Library C to place a mezzanine floor in this department. This will t the growth in this part of the Library for six or eight year shelves can be used at any time in any new library built by

The purchases for the last two years are summarized as

Amount paid for books and binding, 1919.....	\$9
Amount paid for repairs, supplies and labor, 1919.....	2
Amount paid for books and magazines, 1920.....	11
Amount paid for repairs, supplies and labor, 1920.....	3

Respectfully submitted,

FRANK J. PYN

State Lib



STATE OF NEVADA

BIENNIAL REPORT

OF THE

Nevada Industrial Commission

Reviewing the Administration of the Nevada Industrial Insurance Act
for Period—July 1, 1918, to June 30, 1920



CARSON CITY, NEVADA

STATE PRINTING OFFICE : : : JOE FARNSWORTH, SUPERINTENDENT
1921



LETTER OF TRANSMITTAL

CARSON CITY, NEVADA, January

HON. EMMET D. BOYLE, *Governor of Nevada and Chairman of
Industrial Commission Board, Carson City, Nevada.*

DEAR SIR: We have the honor to submit herewith for your
attention and for the information of the Nevada Industrial Com-
mission Board, a review of the administration of the Nevada Indust-
rial Commission Act for the period of the sixth and seventh fiscal years
1918, to June 30, 1920, inclusive.

Respectfully,

GEO. D. SMITH, *Chairman,*
JOHN M. GRAY, *Commissioner*
FRANK W. INGRAM, *Commissioner*
Nevada Industrial Commission

REPORT OF NEVADA INDUSTRIAL COMMISSION

INTRODUCTORY

The service rendered by the Nevada Industrial Commission is confined to the administration of the Elective Workmen's Compensation Act and the monopolistic State Insurance Fund of Nevada. Industrial relations proper come within the jurisdiction of a separate department—the Labor Commissioner—while the enforcement of safety measures, affecting the majority of workmen and the public generally, is divided between the departments of Mine Inspector, Labor Commissioner, Public Utilities, and Public Health. The safety of industries not covered by these boards may become the direct subject of regulation by the Nevada Industrial Commission under authority conferred by the Legislature of 1919, and indirectly considerable pressure may be exerted for the elimination of unsafe working conditions through the power to increase individual contributor's premium rates when his operations are unduly hazardous.

The first requisite of the Nevada Industrial Insurance Act is the collection of funds from subscribing employers for the compensation and care of injured workmen. In carrying out this essential duty the Nevada Industrial Commission has from the first adhered to the principle generally followed in writing workmen's compensation insurance in America, known as the reserve plan. The purpose of this idea is that the assessments levied upon subscribers at varying rates dependent upon the relative hazards of the occupations covered, shall for each year be at least sufficient to meet the total accident cost for the same period, in addition to paying administration expenses. Originally, in 1913, the rates of assessment were included within the Act, but in 1915 this provision was repealed, leaving the determination of premium rates for each occupation to the judgment of the Commission.

The premium rates now in effect have been determined as far as possible from local accident experience. Where the pay-roll exposure was deemed insufficient to give dependable results and to insure an equitable distribution of loss, the basic rates followed by the national insurance carriers, modified to make the final rate applicable to the Nevada Act, have been relied upon. As experience has warranted, rate adjustments have been made in individual classifications, and contributors as a whole have shared in a refund amount to \$131,670.80, representing the surplus premiums collected for the first five years' operations of the State Insurance Fund.

The fiscal operations of the Commission are advantageously shown in tabular form. The developments of the period reviewed in this report have, therefore, been summarized and are presented in that manner in the tables appended to this report, which follow the form recommended by the Statistical Committee of the International Association of Accident Boards and Commissions. Tables 1 and 2 for the State Insurance Fund and Tables 8 and 9 for Accident Benefit (medical aid) Fund are perhaps of most interest since they present the essential features by which compensation rates are measured.

The fiscal year of the Commission used in the tables ends with June 30th—July 1, 1913, marking the inception of the Nevada Industrial Insurance Act. By waiting until December to assemble pay-roll totals and accident cost incurred six or more months previously, many of the individual records are closed or permit of close approximation so that the amount of estimation carried into the records is considerably reduced.

Of particular significance in reviewing the administration of the Insurance Act for the sixth and seventh fiscal years, as set forth in these tables, is that notwithstanding a considerable decrease in pay-roll exposure, number of employees covered, amount of premiums earned, and number of compensatory accidents incurred, the total amount of accident cost experienced decreased very little, while the average amount of compensation paid per case is greater than ever before. Decreasing from \$20,044,521 for the year ending June 30, 1918, pay-roll exposure for the sixth year was \$17,572,017, for the seventh, \$18,837,809; from an average of 13,000 employees covered in 1917 and 1918, the number of workers reported for the sixth fiscal year was 10,495, for the seventh 10,610; from the high of \$455,433 collected for compensation premiums in the fifth fiscal year, premium income has declined to \$330,191 and \$338,183 for the respective fiscal years covered by this report. There was a decline in the number of compensatory accidents from approximately 1,200 in 1917 and 1918, to 700 in 1919 and 1920, with total compensation cost of \$266,152 and \$272,337 for the sixth and seventh fiscal years respectively, and average compensation per case \$363.60 and \$389.05 for these years—approximately one-third greater than in prior experience.

The decreases referred to have been experienced principally in copper and miscellaneous metal mining and ore reduction, and are not offset by the heavy increase in pay-roll exposure and premium income noted in Class 6, Municipal, and Class 7, Miscellaneous Industries.

A statement of income and disbursements, and assets and liabilities for the State Insurance and Accident Benefit Funds, as of June 30, 1920, will be found in the copy of the report of Geo. K. Edler, C. P. A., to the Industrial Commission Board on the condition of these funds, which follows the tables.

The usual statement of experience by classes showing the cumulative income, charges, and class balances has been omitted. Although it is useful, because many contributors are familiar with it, such a statement is somewhat misleading since it does not take into account interest earnings, which are a proper credit to classes. Cumulative class experience can be quickly assembled by consolidating Tables 1 and 2 of this and the preceding biennial report with the statement of class balances contained in the pamphlet accompanying the refund, dated July 1, 1919.

REFUND OF EXCESS PREMIUM COLLECTIONS

In conformity with the provisions of Subdivision c of Section 21 of the Act, the assets and liabilities of the State Insurance Fund were determined in 1919 for the first five years' operations, and the excess premiums, amounting to \$131,670.80, were distributed to the contributors of the period. The percentage of premiums refunded for each of the seven classes, in accord with their respective showings, was:

Class 1.....	6.827%	Class 5.....	45.764%
Class 2.....	None	Class 6.....	11.965%
Class 3.....	10.441%	Class 7.....	12.686%
Class 4.....	20.830%		

Although premium collections for the sixth fiscal year showed a slight balance, particularly Classes 1 and 3, which have consistently shown a favorable balance, the surplus was not refunded in anticipation of a less favorable experience for the ensuing year. However, the operations during the seventh fiscal year greatly increased this surplus, justifying the declaration of a refund to the contributors of Classes 1, 3, 4, 5 and 6 for the period July 1, 1918, to June 30, 1920.

The rates in effect at the beginning of the period covered by this report have for the most part proved adequate and have been continued with few exceptions, notwithstanding a ten per cent increase in compensation benefits, effective July 1, 1919. Following a consistently favorable showing, the premium rate for municipal road construction was reduced on January 1, 1920, to two per cent without blasting and three per cent with blasting. This was the only material change made in rates during the biennium.

The Accident Benefit Fund surplus has not been refunded, as explained below, owing to the impossibility of reaching all who contributed to it. Instead Accident Benefit rates were reduced to meet the actual cost experience developed.

COMPENSATION

The purpose of the Nevada Industrial Insurance Act is to secure to every employee injured in the course of employment, or his dependents, prompt, informal and inexpensive adjudication of his rights, and certain payment of compensation without regard to fault. The fulfillment of this idea has been the constant aim of the department. Reports of an accident by the employer, a medical statement from the attending physician, together with the injured workman's claim for compensation, constitute the average record. Blanks for the rendition of reports are furnished by the Commission and are available wherever men work. Delay in making payment is invariably due to failure to file these reports, particularly the workman's claim. Follow-up requests, to the point of annoyance, are sent out whenever notice of the happening of an accident is received in an attempt to obviate delay in prompt claim adjustment.

A survey of the time which elapses before first payment of compensation is made by the state commissions was undertaken recently by the United States Bureau of Labor. In the summary of results, Nevada is placed second only to Oregon in the promptness with which state funds settled claims. The average time to make first payment in Nevada was found to be thirty-six days, although the first payment is not due until thirty days after the beginning of the disability period.

Increased compensation allowances granted at the last legislative session were calculated to produce approximately an eleven per cent increase in pure compensation cost. However, pay-rolls increased a similar amount by the time the amendments went into effect, so that little or no increase in pure compensation cost is observed for the major classifications in Tables 1 and 2. With the elimination of overtime, and the reduction

in wage rates which is now predicted, the effect of the increased benefits will be apparent.

The allowance of ten dollars per month during disability where the injured workman is supporting dependents, has been a great boon in these cases. It would appear preferable to confine further increases in compensation allowances to this class, who are necessarily harder pinched than the man without dependents when an industrial catastrophe overtakes them. The allowance for single men is believed to be ample to provide reasonable living expenses until the period of disability ends. From the information received during the seventh fiscal year relative to dependency, it appears that forty per cent of all injured workmen were supporting total dependents.

The first pension allowed in a fatal case will soon lapse with the passage of the limited period for which compensation was originally allowed. During the past year there have been a greater number than usual of cases closed by reason of remarriage of beneficiaries. The lapses of pensions from all causes are set forth in the table below, which also shows the total number of pensions allowed to date:

EXPIRATION OF AWARDS BY REMARRIAGE AND DEATH, SHOWING COMPENSATION AWARDED, PAID AND SET UP FOR CHILDREN

Classification	Original number cases	Number cases lapsed	Book value of awards	Paid before termination	Supplemental awards to children
Widow only	22	5	\$28,445.02	\$8,471.70	.....
Widow and one child	21	5	31,141.98	7,615.40	\$5,867.42
Widow and two children	18	5	27,487.50	3,656.36	9,843.68
Widow and three children	10	2	11,000.00	3,380.00	4,676.66
Total	71	17	\$98,074.50	\$28,123.46	\$30,351.76
Death before expiration of award—					
Widow only	1	1	\$4,000.00	\$683.37	.....
Widow and one child	1	1	4,812.50	1,504.71	\$2,805.25
Widow and two children*	1	1	5,000.00	150.00	.....
Widow and three children	1	1	5,000.00	2,980.00	2,040.00
Total	4	4	\$18,812.50	\$5,298.08	\$4,845.25
Grand total	75	21	\$111,887.00	\$33,421.54	\$35,227.01

*Widow destroyed herself and two children. Of the remarriages five occurred in 1920.

The nature of the injuries and the amount of compensation incurred therefor for each of the years reviewed herein was:

Nature injuries	Sixth fiscal year July 1, 1918-June 30, 1919		Seventh fiscal year July 1, 1919-June 30, 1920	
	No. cases	Compensation	No. cases	Compensation
Temporary injuries	1,058	\$34,386.34	1,030	\$42,770.30
Permanent injuries	138	145,409.00	113	96,687.35
Fatal injuries, including permanent total	36	82,245.80	33	129,129.64
Funeral benefits		4,112.30		3,750.00
Total	1,212	\$266,152.94	1,176	\$372,337.29

This information is given in greater detail in the tables included in the statistical portion of the report. Table No. 3, showing the disposition of fatal cases and the character of beneficiaries aided, is followed by separate summaries of the frequency and severity of accidents. Although the severity of accidents from the standpoint of compensation cost has

increased, a satisfactory reduction in the number of fatalities is noteworthy. Fatal accidents reported, and the number of dependents thereby created, have declined approximately one-third in the past two years. The percentage of fatal cases with no dependents is considerably higher. The average compensation paid on all fatal cases in the sixth fiscal year was \$2,239.15; for the seventh, \$2,594.82.

ACCIDENT BENEFITS

A substantial increase in the number of contributors to the "Accident Benefit" Fund, in the number of employees covered, in the amount of pay-roll exposure, and premium income, will be noted upon reference to Tables 8 and 9. Favorable balances continue to be shown by all of the classes included within this provision of the statute, notwithstanding reductions in the rates for furnishing medical treatment in addition to compensation coverage. It was decided that it would not be advisable to refund the surplus shown in the statement of this fund, for a considerable part of these premiums were supplied by employees who cannot be reached now. It is hoped that it will be possible to use this surplus some time in the future to endow a modern physiotherapy department in a Nevada hospital, or preferably in connection with some convenient state institution. No better use could be made of these funds.

Some remarkable restorations to function have been obtained by referring "Accident Benefit" cases to the physiotherapy department of the Hahnemann Hospital in San Francisco, which probably excels industrial hospitals of the West in this feature. Physiotherapy proved of incalculable benefit in restoring apparently permanent disability cases in the army and navy, and will undoubtedly be used more generally by surgeons in Nevada as they become familiar with its benefits, and particularly when the treatment can be made more accessible to Nevada patients.

Occupational therapy during the period of convalescence and vocational rehabilitation for those whose injuries prevent return to work at former occupations are equally important. Fortunately, the means of taking care of the latter cases is now at hand through cooperative funds of the Federal and State Governments, administered jointly by the State Board of Education and the Nevada Industrial Commission.

A resume of the activities of the rehabilitation department will be found in the report of the State Superintendent of Schools. Two cases undergoing training at the instance of the Commission before the passage of the Vocational Rehabilitation Bill by Congress have been turned over to the Director of Rehabilitation for closer supervision.

The Commission has continued to enjoy the most amicable relations with the medical profession in the handling of Accident Benefit cases. In keeping with the increasing cost of treatment, a voluntary increase in all items of the fee schedule was adopted. Claimants are allowed to choose the attending physician in all Accident Benefit cases, although the Commission has in a few instances thought it advisable to refer cases to specialists in other States, in keeping with the aim to furnish ideal treatment where the Commission has supervision.

The information relative to employers' hospital arrangements, assembled by the Commission pursuant to subdivision (d) of Section 23 of

the Act, is summarized herewith. All employers, who notified the Commission that they had made hospital arrangements, were requested to supply the information asked for in the statute, but less than one-half of these employers replied. It should be noted that the Commission knows nothing in advance of the character of these arrangements, or their sufficiency. In case the employer fails to insure this liability, and proves unable to give the necessary treatment in a serious case, it would be incumbent upon the Commission to use the State Insurance Fund for this purpose, a situation which could be avoided by requiring approval of the employers' hospital arrangements before relieving him of the liability for Accident Benefit premiums.

**SUMMARY OF REPORTS SUBMITTED BY EMPLOYERS FOR THE YEAR
1919 PURSUANT TO SUBDIVISION "D," SECTION 23, NEVADA
INDUSTRIAL ACT.**

Class	1-2-3	4	5	7	Total
Number of employers reporting.....	154	4	9	9	176
Total amount fees collected from employees.....	\$64,086.41	\$2,883.00	\$294.00	\$13,968.50	\$81,346.91
Total amount hospital fees contributed.....	93,290.27	1,298.00	57.50	20,843.05	115,488.82
Itemized account expenditures—					
(a) Contracts with physicians.....	15,963.54	574.00	68.40	8,230.00	130,423.47
(b) Hospital.....	127,022.37	3,401.10	110.50	23,918.61	154,452.58
(c) Drugs and dressings.....	3,783.46	153.45		2,469.82	6,406.73
(d) Miscellaneous.....	5,667.35			4,682.20	10,349.55
Balance remaining.....	4,159.53	379.40	44.60	222.50	4,806.03
Number of employers who furnish aid in sickness.....	122	2	3	5	132
Number of employers who do not collect fees from workmen.....	5	1	4	1	11

ADMINISTRATIVE EXPENSE

The expenses of the Commission are paid from the premiums received from employers. With the exception of office space furnished in the Capitol, and the privilege of having printing done without cost by the State Printing Office upon stationery supplied by the Commission, the expense of administrating the workmen's compensation act does not fall upon the general taxpayers. The item of \$5,000 for the Nevada Industrial Commission, which appears in the general appropriation act, is for industrial insurance premiums for state employees for two years.

While the total annual cost of administration for the sixth and seventh fiscal years is less than it has been for several years, the ratio of administrative expense to premium income has necessarily increased as premium income became less. The staff of the department has been kept at the minimum consistent with reasonably adequate service to the employer and his employees. There have been but few changes in the personnel of the department since its creation. Five of the original employees are still with the Commission; the other three were appointed to fill vacancies before the present Commission took office.

Of the three Commissioners, the Chairman, George D. Smith, held office at the time of the last report; John M. Gray was appointed to succeed Commissioner H. A. Lemmon when the latter accepted a responsible position in Halifax, Nova Scotia; Frank W. Ingram, ex officio Labor Commissioner, took office June 2, 1920, when Commissioner

A detailed statement of the expenses of the Commission for the sixth and seventh fiscal years follows. The practice of including a depreciation charge on furniture and fixtures as part of current administrative expenses, began with the fourth fiscal year:

	Total to June 30, 1918	Year ending June 30, 1919	Year ending June 30, 1920
Organization expense.....	\$2,082.77		
Rent and expense.....	1,537.80		
Legal expense.....	1,329.10	\$122.85	\$183.47
Claim investigation.....	2,509.38	448.15	363.26
Transportation—Commissioners.....	977.06	15.21	310.52
Transportation—Auditors.....	6,948.85	972.15	1,438.75
Hotel account—Commissioners.....	1,037.30	45.00	149.40
Hotel account—Auditors.....	8,450.00	1,323.00	1,457.50
Incidental expense—Commissioners.....	57.05	2.75	34.75
Incidental expense—Auditors.....	251.65	2.85	16.00
Salaries—Commissioners.....	19,310.00	5,310.00	5,270.00
Salaries—Auditors.....	13,475.00	1,800.00	1,800.00
Salaries—Physicians.....	9,825.00	2,362.50	1,850.00
Salaries—Office.....	76,329.33	15,761.70	15,883.75
Printing and stationery.....	2,987.65		
Postage.....	2,491.59	569.27	602.08
Office supplies and expense.....	5,652.76	1,327.90	843.95
General expense.....	6,145.08	1,848.09	2,408.78
Physicians Accident Benefit Fund.....	500.00	300.00	
Depreciation.....	2,694.71		1,448.65
Total	\$164,592.08	\$31,935.30	\$34,060.86

INVESTMENTS

At the close of the period covered by this report—June 30, 1920—the funds administered by the Nevada Industrial Commission were invested as follows:

Bonds

White Pine County, Nevada, 6% Lund School District bonds (par value \$6,200).....	\$6,200.00
Massachusetts State 3½% bonds (par value \$50,000).....	47,742.02
Humboldt County, Nevada, 5½% bonds (par value \$70,000).....	70,000.00
Mississippi State 4½% bonds (par value \$25,000).....	25,548.10
Cuyahoga County, Ohio, 4½% bonds (par value \$25,000).....	25,628.23
Washoe County, Nevada, 5% bonds (par value \$2,000).....	2,000.00
U. S. Liberty Loan 4½% bonds (par value \$172,000).....	172,000.00
U. S. Victory Liberty Loan 4½% bonds (par value \$40,000).....	40,000.00
Churchill County, Nevada, 5% bonds (par value \$25,000).....	25,000.00
Esmeralda County, Nevada, 6% bonds (par value \$8,000).....	8,000.00
Mineral County, Nevada, 6% bonds (par value \$27,000).....	27,225.00
Ormsby County, Nevada, 5% Courthouse bonds (par value \$70,000)....	70,000.00
Elko County School District No. 1, 6% bonds (par value \$24,000).....	24,237.89
City of Reno General Improvement 5½% bonds No. 3 (par value \$50,000).....	50,000.00
	\$593,581.24

Interest-bearing Special Deposits (Secured)

Farmers' Bank of Carson Valley.....	\$32,500.00
Carson Valley Bank.....	55,000.00
Copper National Bank.....	10,000.00
Scheeline Banking & Trust Company.....	10,000.00
	\$107,500.00

All of the investments secured since the last biennial report, with the

exception of Liberty Bonds, are local issues. Because of the higher interest rate obtained from Nevada municipal bonds, the average rate of interest obtained from the invested funds increased from 3.955% during the fifth fiscal year to 4.243% for the sixth fiscal year, and 4.552% for the seventh fiscal year.

The monthly income from interest for June, 1920, amounted to \$2,706.26. This item increased to \$3,142.75 in the month of December, 1920, following the purchase, at par and accrued interest, of City of Reno improvement 5½% bonds, and State of Nevada 6% highway bonds, after disposing of \$40,000 par value Victory Liberty Loan 4½% bonds, and \$15,000 par value Elko County School District 6% bonds.

The continued growth in the amount of the investments held for the State Insurance Fund is by no means an indication that the operations of the fund are exceedingly profitable, as some people imagine. The fund is operated on the principle that collections for each year should take care of the total cost of accidents of the same year. The actual settlement of claims are of course not effected within the year, but are spread over several years, due to the payment of compensation monthly. The reserve for catastrophe, and the reserves set aside to guarantee full settlement of these monthly payments during the life of the award, even if premium income should cease, constitute these investments. An average of \$5,000 per month is now disbursed as pension payments in fatal and permanent total disability cases.

LITIGATION

In the adjudication of the complicated issues, which frequently come up in compensation cases, an occasional exception is bound to be taken. In such cases, the claimant, dissatisfied with the findings of the Commission, is able to have the issues of his case tried anew before a jury in the District Court. Neighborhood sympathy then carries as much, if not greater, weight than the issues involved.

Two appeals from the decision of the Commission have been defended in the seventh fiscal year, with the findings of the jury in favor of the plaintiff.

Nick Vico

This case involved the question of disease or injury.

Claimant was hired in Salt Lake City in March, 1918, with a number of other laborers, by the Nevada Consolidated Copper Company, and transported to Ely, Nevada. About 10 a. m. of the first day he worked, while lifting with three fellow workmen, Vico claimed to have strained his back and quit work. He walked home with difficulty, but was able to walk to the doctor's office on each of the succeeding days until his disability was diagnosed as "Potts Disease"—tubercular spine—when Vico was taken to the company's hospital and a cast applied. Claimant did not work for six months before March 2, 1918, and asked for an easy job when he came to work, saying he suffered with his back. His claim for compensation was denied upon the ground that his disability was due to disease, the lifting merely calling claimant's attention to his condition. Suit was brought in the Ninth Judicial District Court before a jury, whose verdict was for the plaintiff.

Jerry Mahoney

This case involved the question whether the injuries arose out of and in the course of employment.

On the day of the accident, claimant had been transferred to Tonopah Junction to act as section foreman on the Tonopah and Goldfield Railroad during the absence of the regular foreman. After finishing the day's work, Mahoney, without authority, went to Tonopah on a gasoline speeder, accompanied by a Mexican section laborer, and remained there a short time. While running without lights on the return trip, he ran into another speeder, also running without lights and used without authority. As a result of the collision, Mahoney sustained frightful injuries, totally disabling him for life. In his claim for compensation, Mahoney alleged that he needed two section hands and went to Tonopah to hire them. The company records show that a full crew worked on the day of the accident, and that the foremen were supposed to stay on their respective sections and were seldom permitted to leave their sections to hire men, and then only with special authority. The claim was rejected on the ground that claimant's injuries were not received in the course of employment. He brought suit in the Fifth Judicial District Court and was awarded full compensation for permanent total disability by a jury.

Nevada Industrial Commission v. Nevada Transportation Company

The Nevada Industrial Commission filed suit against the Nevada Transportation Company, operating the Eureka-Palisade Railway, for reimbursement for medical expenses advanced under authority of subdivision (e), section 23. Notice was served upon the employer, that in the opinion of the Commission, there were reasonable grounds for believing that the recovery of a section man, injured in the course of employment of that company, was being delayed, and that the services of a specialist were advisable. No attention having been paid to the order, the patient was sent to an orthopedic specialist in San Francisco, who reduced the disability to a great extent. This action has been pending since January 29, 1920.

Alfred Dahlquist, Deceased

The issue is whether claimant was the wife of deceased, as required by statute, at the time of the accident, which resulted fatally. The couple had been engaged for a considerable time, and were married the day after the injury, according to press reports, ostensibly to make the widow the beneficiary under the compensation laws. Upon rejection of the claim on the grounds that the claimant was not the wife at time of injury, complaint was filed in the Fifth Judicial District Court in Nye County June 11, 1920, alleging that the widow was a common-law wife at the time of the accident. This allegation was not presented to the Commission.

Several other claims, involving the issue of common-law marriage, have been presented to the Commission, and three allowed upon submission of proof that relationship constituted valid marriage according to existing law. One of the first death claims presented involved this issue and was rejected; the suit filed six years ago, and continued from time to time, has never been pressed.

Likewise the Backich case, mentioned in the last report, is still pending, awaiting the pleasure of plaintiff's attorneys.

FARMERS

Very few farmers have accepted the benefits of the Nevada Industrial Insurance Act for their employees under the modification of section 43 of the Act, passed at the last legislative session.

A considerable number of inquiries relative to the status of farmers have been received, but only a few have elected to pay the premium rate of one per cent of the total pay-roll announced for this coverage. Farming is more dangerous than popularly supposed, and some rather severe injuries received by farm laborers in the past year have been brought to the attention of the Commission. The injured laborer is compelled to bear the entire loss in the majority of cases. The most he gets is medical attention. There appears to be no good reason, from the standpoint of social justice, for exempting farmers from the provisions of a Workmen's Compensation Act.

AMENDMENTS

In addition to the need for correcting the present practice of permitting certain employers to declare themselves not subject to the payment of "Accident Benefit" premiums, without stating the character of the hospital arrangements entered into, and the observation that farm labor should be included within the provisions of an ideal Workmen's Compensation Act, the following administrative suggestions for amendments to the Nevada Industrial Insurance Act are respectfully submitted:

That municipal contractors be included among those in subdivision b of section 1 upon whom provisions of the Act are obligatory.

That the principal contractor be made responsible for the pay-roll returns and premiums due from all subcontractors.

That method of computing allowances to partial dependents in paragraph 7, of subdivision (a), section 25, should be revised to provide a certain percentage of the contributions received from the deceased, not to exceed the allowance to total dependents. Under the statute in its present form, these allowances are pitifully small.

COMPARATIVE STATEMENT OF CONDITION OF STATE INSURANCE FUND

	36 months ending June 30, 1916	12 months ending June 30, 1917	12 months ending June 30, 1918	12 months ending June 30, 1919	12 months ending June 30,
Total number contributors for period.....	1,565	1,037	967	798	
Average number of employees.....	11,306	13,410	12,981	10,495	
Pay-roll exposure.....	\$38,567,664.98	*\$17,704,724.99	\$20,044,621.25	\$17,572,017.45	\$18,887
Earned premiums.....	\$743,230.17	\$408,866.15	\$455,433.33	\$330,191.53	\$358
Compensation paid, award, or estimated due for accidents of period.....	\$651,150.38	\$313,002.53	\$316,277.49	\$286,152.94	\$272
Number of claims filed during period.....	2,069	1,333	1,300	846	
Administrative expense.....	\$89,474.46	\$37,049.84	\$35,424.17	\$31,985.30	\$34
Ratio administrative expense to premium income.....	12.04%	9.06%	7.83%	9.67%	
Total surplus, including catastrophe reserve, end of period.....	\$11,898.08	\$198,662.67	\$246,613.77	\$248,987.67	\$198
Amount of investments at end of period.....	\$109,445.00	\$273,433.23	\$629,750.12	\$759,744.71	\$701
Interest.....	\$1,745.42	\$7,085.19	\$18,662.84	\$29,691.46	\$30
Average rate of interest earned.....	3.645%	3.705%	3.955%	4.243%	

*Pay-roll in excess of \$120 per month not included prior to January 1, 1917.

CAUSES OF SUSPENSION AND REJECTION OF CLAIMS

Cause	No. cases sixth fiscal year				No. cases seventh fiscal year			
	Total No.	Extent of disability			Total No.	Extent of disability		
		Temporary total	Permanent partial	Fatal		Temporary total	Permanent partial	Fatal
Disability less than seven days.....	36	36			46	46		
Employer not a contributor, or in default.....	13	12			9	7		
Proof of injury incomplete.....	11	11		1	8	8		1
Disease, not injury.....	6	5		1	3	3		
Claim not filed within statutory time.....	10				3	3		
Not by accident in course of employment.....	10	7	3		8	8		
No known dependents.....	16			16	4			
Insufficient proof of marriage.....					1			
Other causes.....					2	2		

TABLE
Compensation Cost of Accidents of Sixth Fiscal Year

Industry	No. compensated	No. full time workers	Pay-roll exposure	Premiums
Classes 1 and 2—Mining and Ore Reduction—				
Copper.....	39	698	\$1,352,598.61	\$35,077.59
Gold and silver.....	289	2,161	4,225,277.15	106,434.32
Miscellaneous.....	58	342	628,286.78	16,269.07
Nonmetal.....	9	99	154,946.18	3,974.35
Total mining.....	395	3,300	\$6,361,108.72	\$163,755.33
Ore milling, moist way.....	84	517	\$996,602.97	\$22,423.56
Plaster mills.....	4	59	105,652.16	1,584.79
Smelting.....	6	112	229,246.98	4,584.98
Total ore reduction.....	94	688	\$1,331,502.11	\$28,593.33
Construction, mine and mill.....	---	117	\$237,486.78	\$7,718.33
Clerical, office.....	---	141	245,996.89	615.00
Commissary.....	---	91	111,427.60	520.14
Assaying.....	---	19	38,244.04	572.22
Total classes 1 and 2.....	489	4,856	\$8,325,766.14	\$301,774.50
Class 3—Nevada Con. Copper Co.—				
Underground.....	---	283	\$556,330.96	\$14,410.95
Open pit, steam shovel.....	---	432	674,368.02	16,889.21
Smelting.....	---	1,010	1,732,586.00	25,988.49
Crushing and concentration.....	---	802	1,065,455.67	7,980.92
Auxiliary works.....	---	183	353,616.50	8,840.42
Clerical.....	---	125	221,377.63	553.44
Total class 3.....	---	2,635	\$4,608,714.68	\$74,643.43
Class 4—Railroads—Total.....	11	335	\$501,146.19	\$9,085.20
Class 5—Public Utilities—				
Electric light and power.....	15	208	\$255,358.21	\$5,238.35
Telephone and telegraph.....	6	106	139,392.42	736.60
Water-works.....	7	48	68,310.42	833.44
Gas-works.....	3	15	17,636.58	212.12
Total class 5.....	31	437	\$474,597.63	\$7,070.51
Class 6—State and municipal—				
Clerical, including schools and university.....	49	996	\$1,280,990.24	\$2,715.40
Prison, Asylum, School of Industry, State Police.....	4	57	82,434.40	1,000.00
Peace officers and paid firemen.....	---	138	189,601.38	1,982.07
Road construction.....	---	175	219,800.27	4,816.98
All other.....	---	182	216,617.68	1,348.15
Total Class 6.....	53	1,488	\$1,999,443.87	\$11,864.13
Class 7—Miscellaneous—				
Auto dealers, garages, stages.....	27	61	\$100,559.72	\$1,357.16
Brewing, bottling, ice manufacturing.....	5	15	23,208.52	305.29
Coal, wood, fuel.....	3	10	12,261.45	163.10
Construction, building.....	27	36	64,972.25	1,698.16
Construction, steam railroad.....	2	17	25,866.65	1,006.13
Creameries, dairies.....	4	13	17,892.70	187.32
Flour milling.....	4	33	58,106.96	753.55
Foundries, machine shops.....	3	20	43,564.70	545.42
Hotels, saloons, restaurants.....	15	94	109,999.66	525.23
Laundries.....	7	103	94,356.53	841.85
Logging and lumbering.....	4	174	268,063.63	7,325.38
Logging railroad.....	1	15	22,637.02	2,263.70
Lumber yard, no machinery.....	9	29	49,648.97	800.31
Packing houses.....	2	135	161,044.68	2,624.95
Printing.....	7	34	81,896.15	376.71
Stores, mercantile.....	52	200	285,686.65	1,782.32
Teaming and transfer.....	12	29	55,077.20	785.96
Warehouse.....	1	2	1,744.50	25.42
All other.....	26	204	200,742.09	1,925.22
Total Class 7.....	211	1,244	\$1,667,348.95	\$25,753.55
Total all classes.....	798	10,495	\$17,572,017.46	\$330,191.58

No. 1
July 1, 1918, to June 30, 1919

Compensation					Rates compensation cost		
All cases	Deaths	Permanent partial		Temporary disability only	No. compensatory cases	Average per case	Average per \$100 pay-roll
		Temporary total with	Permanent partial				
\$24,756.71	\$7,500.00	\$5,005.71	\$9,908.47	\$2,347.53	65	\$380.87	\$1.83
98,466.55	34,839.15	12,368.57	33,522.57	12,736.26	263	355.39	2.212
12,397.70	7,228.87	1,874.35	2,190.68	1,603.80	28	442.78	1.973
1,658.42		378.00	794.27	481.15	10	165.34	1.067
\$132,274.38	\$49,568.02	\$19,126.63	\$46,410.99	\$17,168.74	366	\$361.41	\$2.078
\$24,467.49	\$12,969.86	\$1,827.05	\$7,344.67	\$2,325.91	44	\$556.08	\$2.455
3,156.60		458.65	2,630.95	7.00	2	1,578.30	2.987
7,614.06		1,623.70	4,325.05	1,465.31	19	400.74	3.321
\$36,238.15	\$12,969.86	\$4,109.40	\$14,360.67	\$3,798.22	65	\$542.13	\$2.646
\$1,872.15	\$1,025.00	\$109.65	\$360.00	\$377.50	6	\$312.02	\$0.788
168.00				168.00	1	168.00	.150
\$169,562.68	\$63,562.88	\$23,345.68	\$61,131.66	\$21,512.46	438	\$387.11	\$2.036
\$25,961.57	\$9,340.32	\$3,157.00	\$9,656.91	\$3,807.34	84	\$309.07	\$0.466
4,082.32		1,115.90	2,445.39	521.03	21	194.40	.605
7,340.95	125.00	1,083.35	4,476.92	1,656.68	33	222.45	.424
3,169.88	1,217.80	329.90	547.65	1,074.53	22	144.09	.297
5,669.52		1,309.68	3,620.28	739.56	29	195.50	1.603
\$46,224.24	\$10,688.12	\$6,995.83	\$20,747.15	\$7,798.14	189	\$244.57	\$1.004
\$13,574.95	\$5,134.65	\$1,111.00	\$7,166.40	\$162.90	9	\$1,508.32	\$2.708
\$915.00		\$140.00	\$600.00	\$175.00	3	\$306.00	\$0.358
121.35				121.35	2	\$60.67	.087
499.85		49.00	300.00	150.85	3	166.61	.080
11.00				11.00	1	11.00	.063
\$1,547.20		\$189.00	\$900.00	\$458.20	9	\$171.91	\$0.326
\$1,091.45		\$91.25	\$987.50	\$62.70	3	\$363.81	\$0.085
562.70		67.20	495.50		1	562.70	.297
267.62		116.25	65.62	85.75	3	89.20	1.218
\$1,921.77		\$274.70	\$1,498.62	\$148.45	7	\$274.54	\$0.961
\$1,700.85		\$175.00	\$1,429.00	\$96.85	4	\$425.21	\$1.691
62.00				62.00	1	62.00	.268
232.23				232.23	5	46.45	1.894
8,068.25	6,976.95			1,086.30	7	1,151.89	12.410
1,175.40		90.00	1,085.40		1	1,175.40	2.023
75.15				75.15	2	37.57	.172
343.00				343.00	2	171.50	.311
51.25				51.25	2	17.08	.064
4,723.69		415.00	3,877.86	430.83	13	363.36	1.830
151.00				151.00	3	50.33	.667
2,198.35		285.22	1,766.48	146.65	5	439.67	4.427
2,256.13		417.05	967.00	882.08	16	141.01	1.400
982.55		147.68	699.87	135.00	4	245.64	.343
166.55				166.55	6	27.76	.302
14.00				14.00	1	14.00	.080
11,136.70		675.00	10,028.40	438.30	7	1,590.96	5.547
\$33,332.10	\$6,976.95	\$2,204.95	\$19,844.01	\$4,306.19	80	\$416.65	\$1.999
\$296,152.94	\$86,357.60	\$34,121.16	\$111,287.84	\$34,386.34	732	\$363.60	\$1.514

TABLE
Compensation Cost of Accidents of Seventh

Industry	No. compensation- injured	No. full time workers	Pay-roll exposure	Premiums
Classes 1 and 2—Mining and Ore Reduction—				
Copper mining	22	873	\$787,290.80	\$19,682.26
Gold and silver mining	404	2,473	5,097,810.02	127,632.77
Miscellaneous metal mining	33	206	428,177.72	10,664.44
Mining, nonmetal	18	171	298,890.56	7,489.51
Total mining	477	3,222	\$6,609,158.90	\$165,228.98
Ore milling, moist way	67	388	\$793,383.10	\$17,861.12
Plaster mills	5	67	118,216.12	1,773.24
Smelting	6	15	27,428.48	548.57
Total ore reduction	78	492	\$939,027.70	\$20,172.93
Construction, mine and mill buildings		119	\$255,391.12	\$8,300.22
Clerical, office employees		142	262,912.37	667.28
Commissary employees		106	137,964.78	651.55
Assaying		41	86,600.69	1,299.00
Total Classes 1 and 2	555	4,122	\$8,291,045.56	\$196,871.71
Class 3—Nevada Consolidated Copper Company—				
Underground mining operations	1	209	\$405,312.09	\$10,132.80
Open pit, steam shovel		306	507,201.84	12,680.04
Smelting	1	696	1,266,698.19	18,963.97
Crushing and concentration		495	946,422.25	7,086.16
Auxiliary works		156	309,820.45	7,745.51
Clerical		125	224,768.70	561.92
Total Class 3	2	1,965	\$8,659,123.52	\$67,202.40
Class 4—Railroads—Total				
	11	291	\$484,541.12	\$8,249.20
Class 5—Public Utilities—				
Electric light and power	16	185	\$266,580.18	\$4,614.42
Telephone and telegraph	6	184	178,365.40	797.79
Water-works	8	64	101,775.38	1,125.33
Gas-works	2	14	20,743.85	204.76
Total Class 5	32	447	\$567,464.81	\$6,742.21
Class 6—State and Municipal—				
Clerical, including schools and University	30	1,290	\$1,964,235.03	\$3,708.47
Peace officers, pd. firemen, Asylum, Prison, S. Ind.	4	208	442,995.94	5,447.99
Road construction	44	372	604,535.89	13,188.35
All other	10	254	\$19,212.56	2,128.35
Total Class 6	88	2,119	\$3,220,979.41	\$24,473.16
Class 7—Miscellaneous—				
Auto dealers, garages, stage lines	24	109	\$223,176.28	\$2,197.55
Brewing, bottling, ice manufacturing	4	20	37,162.08	515.66
Coal, wood, fuel dealers	16	63	100,486.59	1,812.51
Construction, building	30	73	158,532.79	3,632.30
Construction, steam railroad	2	21	35,268.29	1,310.22
Creameries and dairies	7	39	56,685.71	496.56
Flour milling	7	34	69,449.05	848.45
Foundries and machine shops	3	25	52,533.85	584.67
Hotels, saloons, restaurants	25	148	199,455.48	1,658.94
Laundries	6	102	110,831.63	968.65
Logging, lumbering, planing mills	3	273	393,795.41	14,712.96
Logging, railroad	1	23	35,222.87	3,622.23
Lumber-yard employees, no machinery	4	7	12,671.02	297.88
Oil-well drilling	5	4	14,270.68	423.97
Packing-houses	3	186	222,902.60	3,341.05
Printing	6	53	90,955.05	418.40
Stores, mercantile, meat markets, bakeries	48	199	322,369.68	1,837.34
Teaming and transferring	13	40	87,106.81	1,297.64
Ranching	14	29	42,170.80	460.44
All other	39	198	349,319.42	4,889.20
Total Class 7	280	1,646	\$2,614,655.19	\$44,644.91
Total all classes	948	10,610	\$18,837,809.61	\$338,183.50

No. 2

Fiscal Year—July 1, 1919, to June 30, 1920

Compensation					Rates compensation cost		
All cases	Deaths	Permanent partial		Temporary disability only	Total No. compensatory cases	Average per case	Average per \$100 pay-roll
		Temporary total with	Permanent partial				
\$18,929.33	\$10,746.13	\$1,828.05	\$3,988.55	\$2,366.60	32	\$591.52	\$2.404
113,500.43	^a 58,606.06	12,479.95	22,910.12	19,505.30	309	367.32	2.227
4,831.30	1,760.00	148.55	795.00	2,137.75	22	219.90	1.134
3,461.45	125.00	677.05	1,552.45	1,106.95	18	192.30	1.160
\$140,722.51	\$71,226.19	\$15,133.60	\$29,246.12	\$25,116.60	381	\$369.35	\$2.129
\$7,544.06		\$1,733.40	\$4,038.56	\$1,772.10	28	\$269.43	\$0.951
177.15				177.15	4	29.29	.150
183.80				183.80	2	91.90	.670
\$7,905.01		\$1,733.40	\$4,038.56	\$2,133.05	34	\$232.50	.842
\$3,672.55		\$809.85	\$1,902.60	\$960.10	17	\$216.08	\$1.438
\$152,300.07	\$71,226.19	\$17,676.85	\$35,187.28	\$28,209.75	413	\$368.77	\$1.837
\$5,421.10		\$1,427.65	\$870.00	\$3,123.45	61	\$88.87	\$1.338
9,572.61	\$250.00	2,023.35	6,357.86	941.40	25	382.90	1.887
7,994.36	4,053.35	1,191.75	1,802.80	946.45	12	666.11	.632
7,464.60	2,800.00	371.00	3,405.80	887.80	19	392.87	.789
1,685.80		261.95	390.00	1,033.85	18	93.65	.544
\$32,138.47	\$7,103.36	\$5,275.70	\$12,826.46	\$6,932.95	135	\$238.06	\$0.878
\$368.15				\$368.15	4	\$92.04	\$0.079
\$15,139.80	\$14,827.10			\$312.70	8	\$1,892.48	\$5.679
57.40				57.40	1	57.40	.032
2,868.43		\$410.05	\$2,212.58	245.85	6	478.08	2.818
\$18,065.68	\$14,827.10	\$410.05	\$2,212.58	\$615.95	15	\$1,806.60	\$3.184
\$11,819.25	^b \$9,840.25	\$132.00	\$1,594.95	\$252.05	10	\$1,181.92	\$0.637
6,841.80	6,677.80			164.00	3	2,280.60	1.544
9,087.12		1,381.60	6,326.17	1,379.35	23	395.09	1.503
1,269.00	1,269.00				1	1,269.00	.397
\$29,017.17	\$17,787.05	\$1,513.60	\$7,921.12	\$1,795.40	37	\$784.25	\$0.901
\$1,773.38		\$372.50	\$1,329.83	\$71.05	4	\$443.34	\$0.795
64.80				64.80	1	64.80	.174
785.00		480.00	250.00	55.00	2	392.50	.781
4,004.65		1,348.45	2,321.35	334.85	8	500.58	2.621
13.40				13.40	2	6.07	.024
467.20		84.00	135.00	248.20	4	116.80	.889
195.20		45.35	149.85		1	195.20	.176
12,284.80	6,976.95	483.38	3,583.02	1,241.45	22	558.40	3.120
13,162.69	12,805.79			356.90	6	2,193.78	37.370
471.13		96.83	125.00	249.30	5	94.22	3.718
237.60				237.60	2	118.80	1.665
1,801.72	528.20	273.75	697.32	302.45	11	163.79	.808
489.65		86.00	175.00	228.65	7	69.95	.152
660.20				660.20	8	82.52	.758
344.65				344.65	4	86.16	.817
3,691.68	1,625.00	395.00	1,232.08	439.60	9	410.19	1.057
\$40,447.75	\$21,935.94	\$3,665.26	\$9,998.45	\$4,848.10	96	\$421.33	\$1.547
\$272,337.29	\$132,879.64	\$28,541.46	\$68,145.89	\$42,770.30	700	\$389.05	\$1.446

^aTwo cases permanent total disability.^bOne case permanent total disability.

TABLE No. 3
Fatalities

	Year ending June 30, 1919				Year ending June 30, 1920			
	No. cases	No. known dependents	Compensation to dependents		No. cases	No. known dependents	Compensation to dependents	
			Total (P.W.)	Average per case			Total (P.W.)	Average per case
No dependents.....	15	None	\$1,875.00		11		\$1,875.00	
Liability estimated, open cases.....	2	2	250.00	\$2,250.00	2	3	250.00	\$2,166.66
Widow only.....	1	1	125.00	3,425.92	2	2	250.00	5,146.12
Widow and one child.....	3	7	246.75	*12,713.87	6	12	750.00	28,034.61
Widow and two children.....	6	18	625.00	34,572.04	2	6	250.00	9,336.16
Widow and four children.....	1	1	125.00	1,092.80	1	6	125.00	10,621.13
Children only.....	6	10	740.55	2,622.44	6	8	750.00	2,173.76
Parents.....	1	1	125.00	900.00				
Sister.....								
Total fatal cases.....	35	40	\$4,112.30	\$78,370.80	30	36	\$3,750.00	\$77,844.66
				\$2,239.15				\$2,694.82

*Includes \$550 to mother as partial dependent. †Includes \$1,022.55 to nephew and niece jointly.

TABLE No. 4
Frequency of Accidents by Industries and Extent of Disability
Sixth Fiscal Year, July 1, 1919-June 30, 1920

Industry	Number full-time workers	Pay-roll exposure	Number of tabulatable accidents				Rates	
			Total	Death and permanent total disability	Permanent partial disability	Temporary disability		Per 1,000 full-time workers
						Over 2 weeks	1 to 2 weeks and under	
Classes 1 and 2—Mining and Ore Reduction—	698	\$1,352,598.91	99	4	15	46	18	142
Copper mining.....	2,141	4,282,558.11	492	16	50	179	76	197
Gold mining.....	828	1,656,558.79	144	1	1	21	8	135
Miscellaneous metal mining.....	98	184,946.18	19			8	3	191
Nonmetal mining.....								
Total mining.....	3,800	\$6,861,104.73	599	21	70	254	99	178
								7.82
								10.00
								7.40
								12.88
								9.26

Ore milling, moist way.....	617	\$998,802.97	55	2	8	31	6	8	106	5.52
Plaster milling.....	59	105,652.16	8	-----	1	1	-----	1	51	2.86
Smelting.....	112	229,246.98	23	-----	5	14	4	10	294	14.41
Total ore reduction.....	688	\$1,331,502.11	91	2	14	46	10	19	132	6.83
All other, classes 1 and 2.....	968	\$633,155.31	8	1	1	5	-----	1	22	1.26
Total Classes 1 and 2.....	4,356	\$8,825,766.14	688	24	86	906	109	166	188	8.27
<i>Class 3—Nevada Consolidated Copper Co.—</i>										
Underground mining (Cav. system).....	233	\$556,330.96	178	6	11	46	24	91	621	32.00
Open pit, steam shovel.....	432	674,968.02	38	-----	4	7	11	16	88	5.64
Smelting.....	1,010	1,732,666.00	43	1	6	22	5	14	47	2.77
Crushing and concentration.....	602	1,046,466.67	44	1	3	12	7	11	73	4.13
Surface, general and clerical.....	908	574,994.08	46	-----	6	15	9	16	149	8.01
Total Class 3.....	2,635	\$4,608,714.68	344	8	30	102	56	148	190	7.47
Class 4—Railroads—Total Class 4.....	335	\$501,146.19	27	1	4	6	1	15	80	5.38
Class 5—Public Utilities—Total Class 5.....	437	\$474,597.63	17	-----	2	7	4	4	39	3.59
Class 6—Municipal, etc.—Total Class 6.....	1,498	\$1,999,443.37	11	-----	3	3	1	4	7	.46
<i>Class 7—Miscellaneous—</i>										
Construction, building.....	36	\$64,972.25	12	1	-----	9	2	-----	393	18.80
Logging and lumbering.....	218	390,869.62	84	-----	6	12	5	11	156	10.30
Packing-houses.....	135	161,044.68	25	-----	3	8	5	9	185	16.52
All others.....	865	1,110,962.40	54	42	5	25	8	14	61	4.86
Total Class 7.....	1,244	\$1,667,348.95	125	3	14	54	20	34	100	7.50
Total all classes.....	10,496	\$17,572,017.46	1,212	36	138	477	191	370	116	6.90

*Including one case permanent disability.

TABLE No. 5
Frequency of Accidents by Industries and Extent of Disability
Seventh Fiscal Year, July 1, 1919-June 30, 1920

Industry	Number full-time workers	Pay-roll exposure	Number of tabulatable accidents					Rates	
			Total	Death and permanent total disability	Permanent partial disability	Temporary disability			
						Over 2 weeks	1-2 weeks		1 week and under
Classes 1 and 2—Mining and Ore Reduction—									
Copper mining.....	373	\$787,290.60	45	1	5	23	4	12	121
Gold and silver mining.....	2,473	5,097,310.02	477	*12	45	210	76	134	193
Miscellaneous metal mining.....	205	428,177.72	41	3	2	18	6	12	200
Mining, nonmetal.....	171	296,390.56	37	1	4	12	4	16	216
Total mining.....	3,222	\$4,608,158.90	600	17	56	263	90	174	186
Ore milling, moist way.....	388	\$793,383.10	41	—	5	23	1	12	106
Plaster milling.....	67	118,216.12	4	—	—	3	1	—	60
Smelting.....	15	27,428.43	2	—	—	2	—	—	133
Total ore reduction.....	492	\$889,027.70	47	—	5	28	2	12	96
All other, Classes 1 and 2.....	408	\$742,858.96	18	—	4	11	3	—	44
Total Classes 1 and 2.....	4,122	\$5,291,045.56	665	17	65	302	95	186	161
Class 3—Nevada Consolidated Copper Co.—									
Underground mining (Cav. system).....	209	\$405,312.09	124	—	3	46	16	59	593
Open pit, steam shovel.....	305	\$67,201.84	45	2	6	13	6	19	148
Smelting.....	695	1,265,566.19	16	1	2	9	2	2	23
Crushing and concentration.....	495	946,422.25	24	2	3	8	3	3	48
Surface, general and clerical.....	291	534,589.15	25	—	2	13	4	6	86
Total Class 3.....	1,985	\$3,659,123.52	234	5	15	89	36	89	118
Class 4—Railroads—Total Class 4.....									
Class 5—Public Utilities—Total Class 5.....									
Class 6—Municipal—Total Class 6.....									
Class 7—Miscellaneous—									
Construction, building.....	78	\$166,832.79	18	—	4	3	3	8	247

Logging and lumbering.....	273	333,795.41	54	3	5	22	10	14	188	13.71
Packing-houses.....	186	222,902.50	33	1	2	6	5	19	177	14.35
All others.....	1,114	1,889,121.49	73	1	9	30	7	26	166	3.97
Total Class 7.....	1,646	\$2,614,655.19	178	5	20	61	25	67	108	6.81
Total all classes.....	10,610	\$18,887,809.61	1,176	33	113	499	163	368	111	6.24

*Includes two cases permanent total disability. †Includes one case permanent total disability.

TABLE No. 6
Severity of Injuries by Industries and Extent of Disability
Sixth Fiscal Year, July 1, 1918-June 30, 1919

Industry	Number full-time workers	Pay-roll exposure	Days lost due to—				Rates			
			Total	Death and permanent disability	Permanent partial disability	Temporary disability		Days lost per 1,000 full-time workers	Days lost per \$100,000 pay-roll	
						Over 2 weeks	1 to 2 weeks			1 week and under
<i>Classes 1 and 2—Mining and Ore Reduction—</i>										
Copper mining.....	698	\$1,352,698.61	33,846	24,000	13,156	1,455	160	75	55,654	5,163
Gold and silver mining.....	2,161	4,225,277.15	145,673	96,000	42,395	6,065	791	422	67,417	5,114
Miscellaneous metal mining.....	842	628,286.78	9,766	6,000	2,869	777	82	48	28,556	551
Nonmetal mining.....	99	154,946.18	1,299	.....	990	264	30	15	13,122	844
Total mining.....	3,900	\$6,361,108.72	195,584	126,000	59,400	8,561	1,063	560	59,280	3,074
Ore milling, moist way.....	517	\$996,602.97	21,755	12,000	8,590	1,061	74	31	42,082	2,194
Plaster milling.....	59	105,652.16	3,248	.....	3,234	.....	.....	3	55,050	3,076
Smelting.....	112	229,246.98	6,096	.....	5,290	712	43	51	54,428	2,659
Total ore reduction.....	688	\$1,331,502.11	31,100	12,000	17,114	1,784	117	85	45,203	2,336
All other, Classes 1 and 2.....	368	\$633,155.31	6,695	6,000	407	292	.....	6	13,198	1,063
Total Classes 1 and 2.....	4,356	\$8,325,766.14	233,379	144,000	76,921	11,627	1,180	651	53,576	2,803
<i>Class 3—Nevada Consolidated Copper Co.—</i>										
Underground mining (Cav. system).....	233	\$556,330.96	49,794	36,000	11,568	1,670	242	314	175,960	8,955
Open pit, steam shovel.....	432	674,983.02	3,754	.....	3,576	246	107	55	8,759	5,614
Smelting.....	1,010	1,732,568.00	12,354	6,000	5,248	894	51	61	12,227	7,182
Crushing and concentration.....	602	1,065,455.67	7,370	6,000	4,746	512	69	43	12,242	6,920
Surface, general and clerical.....	308	574,994.03	4,991	.....	4,455	335	94	57	16,204	8,695
Total Class 3.....	2,635	\$4,603,714.63	78,298	43,000	25,493	3,707	563	530	29,712	17,000
<i>Class 4—Railroads—Total Class 4.....</i>										
	335	\$501,146.19	17,931	6,000	11,595	234	11	41	53,237	3,579
<i>Class 5—Public Utilities—Total Class 5.....</i>										
	437	\$474,597.68	1,332	.....	990	230	51	11	8,048	2,810
<i>Class 6—Municipal, etc.—Total Class 6.....</i>										
	1,438	\$1,999,443.37	2,406	.....	2,347	92	10	17	1,697	1,233
<i>Class 7—Miscellaneous—</i>										
Construction, building.....	36	\$64,972.25	6,021	6,000	.....	603	13	.....	133,973	1,084

Logging and lumbering.....	218	330,389.62	7,508	7,095	373	56	64	34,394
Packing-houses.....	135	161,044.63	1,816	1,379	357	48	32	13,452
All others.....	855	1,110,952.40	17,134	4,138	884	95	67	20,099
Total Class 7.....	1,244	\$1,667,346.95	33,129	12,542	2,217	217	153	26,631
Total all classes.....	10,495	\$17,572,017.46	366,530	129,888	17,207	2,082	1,403	34,924

*Includes one case permanent total disability

TABLE No. 7
Severity of Injuries by Industries and Extent of Disability
Seventh Fiscal Year, July 1, 1919-June 30, 1920

Industry	Number full-time workers	Pay-roll exposure	Days lost due to—				Rates			
			Total	Death and permanent disability	Permanent partial disability	Temporary disability		Days lost per 1,000 full-time workers	Days lost per \$100,000 pay-roll	
						Over 2 weeks	1-2 weeks			1 week and under
<i>Classes 1 and 2—Mining and Ore Reduction—</i>										
Copper mining.....	373	\$787,290.60	11,207	5,000	4,175	951	42	39	30,046	1,428
Gold and silver mining.....	2,473	5,097,310.02	110,502	72,000	29,015	8,071	831	585	44,883	2,168
Miscellaneous metal mining.....	205	426,177.72	19,887	18,000	8,897	920	63	54	97,257	4,678
Mining, nonmetal.....	171	298,380.56	8,423	6,000	1,848	469	42	64	49,267	2,823
Total mining.....	3,222	\$6,609,158.90	180,069	102,000	35,935	10,411	981	742	46,578	2,271
<i>Class 3—Nonmetallic Mineral Products—</i>										
Ore milling, moist way.....	338	\$793,383.10	5,591	---	4,809	728	14	40	14,410	705
Plaster milling.....	87	118,216.12	74	---	---	65	9	---	1,104	59
Smelting.....	15	27,428.48	75	---	---	75	---	---	5,000	278
Total ore reduction.....	482	\$939,027.70	5,740	---	4,809	868	23	40	11,667	611
All other, classes 1 and 2.....	408	\$742,858.96	4,318	---	3,914	369	35	---	10,583	581
Total Classes 1 and 2.....	4,122	\$8,291,045.56	160,127	102,000	44,658	11,648	1,039	782	88,847	1,931
<i>Class 3—Nevada Consolidated Copper Co.—</i>										
Underground mining (Cav. system).....	209	\$405,312.09	3,062	---	1,455	1,245	178	184	14,651	755
Open pit, steam shovel.....	305	507,201.84	20,805	12,000	8,287	398	67	53	68,213	4,102
Smelting.....	685	1,265,588.19	8,771	6,000	2,328	422	16	7	12,620	683
Crushing and concentration.....	485	946,422.25	16,371	12,000	8,928	349	80	14	39,073	1,730
Surface, general and clerical.....	291	534,589.15	974	---	494	407	48	25	3,347	182
Total Class 3.....	1,985	\$3,659,123.52	49,868	30,000	16,490	2,821	389	283	25,180	1,366
<i>Class 4—Railroads—Total Class 4.....</i>										
	291	\$484,541.12	232	---	---	203	---	29	797	48
<i>Class 5—Public Utilities—Total Class 5.....</i>										
	447	\$587,464.81	15,425	12,000	3,146	260	10	9	34,508	2,718
<i>Class 6—Municipal—Total Class 6.....</i>										
	2,110	\$3,220,970.41	33,441	24,000	8,409	900	31	51	15,782	1,038

Class 7—Miscellaneous—																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																			</
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TABLE No 8
Experience of Accident Benefit Fund
Twelve Months from July 1, 1918, to June 30, 1919

Classes	No. contributors	No. full-time workers	Pay-roll exposed	Earned premium	Total benefits	No. cases	Rate of accident benefit cost	Per \$100 pay-roll	Per full-time worker per year
<i>Classes 1 and 2—Mining and Ore Reduction</i>	135	387	\$772,340.30	\$14,079.59	\$4,223.62	51	\$82.82	\$0.547	\$10.91
<i>Class 4—Railroads</i>									
<i>Class 5—Public Utilities</i>	14	61	\$66,731.37	\$287.56	\$25.50	2	\$12.25	\$0.098	\$0.42
<i>Class 6—Municipal—</i>	3	10	\$15,341.45	\$141.97	\$81.50	3	\$27.17	\$0.531	\$8.15
Highway contractors	62	1,459	1,828,050.71	5,091.53	551.56	14	\$8.40	.028	.58
All others									
Total Class 6	65	1,463	\$1,943,392.16	\$5,233.50	\$633.06	17	\$37.24	\$0.084	\$0.43
<i>Class 7—Miscellaneous—</i>									
Auto dealers, auto stages	20	32	\$52,555.62	\$217.73	\$193.00	8	\$24.01	\$0.357	\$6.23
Contractors	20	21	\$7,490.59	\$31.56	425.01	12	\$5.42	1.135	21.25
Hotels, saloons, restaurants	11	53	\$0,890.48	173.15	488.65	4	129.16	.803	8.22
Laundries	3	16	14,908.32	47.25	61.00	3	\$20.33	.409	3.81
Miscellaneous manufacturing (Brick yards, creameries, fertilizer works, flour mills, alfalfa meal mills)	5	35	\$6,614.57	298.97	235.50	3	\$5.17	.507	7.93
Packing-houses	1	139	149,983.18	2,162.14	1,443.76	34	49.46	0.983	11.19
Planing mills	1	19	48,930.25	786.70	548.35	7	77.62	1.827	28.59
Printing	2	19	29,731.59	61.57					
Rubbing									
Stores, mercantile, meat markets	32	124	174,762.40	630.25	239.50	8	\$3.81	.137	1.63
Tanning	7	25	49,823.70	241.86	740.25	9	\$24.70	.682	9.61
Tobacco	27	144	208,074.38	1,063.82	180.00	13	\$11.54	.072	1.04
All others									
Total Class 7	132	618	\$880,871.98	\$4,226.65	\$4,069.99	101	\$40.30	\$0.462	\$6.58
Total all classes	345	2,639	\$3,663,335.41	\$25,907.30	\$8,952.07	171	\$52.85	\$0.244	\$3.53

TABLE No. 9
Experience of Accident Benefit Fund
Twelve Months from July 1, 1919, to June 30, 1920

Classes	No. contributors	No. full-time workers	Pay-roll exposed	Earned premium	Total benefits	No. cases	Rate of accident benefit cost	Per \$100 worker pay-roll	Per full-time worker per year
<i>Classes 1 and 2—Mining and ore reduction</i>	208	743	\$1,448,145.58	\$25,968.65	\$3,438.28	126	\$66.97	\$0.583	\$11.35
<i>Class 3—Railroads</i>	1	7	\$11,456.10	\$143.19	\$5.50	1	\$5.50	\$0.048	\$0.78
<i>Class 4—Public utilities</i>	18	101	\$152,014.21	\$509.06	\$134.00	10	\$13.40	\$0.121	\$1.82
<i>Class 5—Municipal Highway contractors</i>	68 14	1,944 94	\$2,908,029.35 176,429.84	\$4,115.23 1,190.46	\$2,461.27 2,922.37	19 47	\$129.54 62.18	\$0.080 1.666	\$1.25 \$1.09
Total Class 6.....	82	2,088	\$3,063,459.19	\$5,305.69	\$5,333.64	66	\$81.57	\$0.172	\$2.64
<i>Class 7—Miscellaneous—</i> Auto dealers, auto stages Contractors Hotels, saloons, restaurants Laundries Miscellaneous manufacturing (brick yards, fertilizer works, creameries, flour mills, alfalfa meal mills) Packing-houses Planing mills Printing Ranching Stores, mercantile, meat markets Teaming All others	21 17 19 2 12 186 26 22 4 14 35 11 52	98 40 108 10 61 186 28 22 29 119 38 245	\$204,043.75 84,584.65 147,280.25 13,187.16 106,684.54 222,902.50 42,715.50 41,625.75 42,170.80 186,478.08 74,245.41 442,842.99	\$486.24 984.90 346.68 29.87 290.50 2,351.41 318.40 47.76 112.61 319.08 292.57 1,982.54	\$678.50 2,387.55 4.50 635.75 1,027.80 2,387.55 7.00 388.95 635.25 517.92 1,174.40	14 15 1 16 42 6 1 4 13 7 27	\$48.46 159.17 4.50 39.73 24.47 29.40 7.00 99.74 48.17 73.96 43.50	\$0.333 2.822 .003 .596 .461 .844 .016 .846 .315 .697 .265	\$6.92 59.69 .04 10.42 5.52 5.62 33 13.41 5.26 14.39 4.79
Total Class 7.....	192	980	\$1,620,614.33	\$8,056.36	\$7,605.62	145	\$52.45	\$0.470	\$7.76
Total all classes.....	501	3,869	\$6,315,689.41	\$39,632.95	\$31,617.04	348	\$82.12	\$0.342	\$5.59

GEO. K. EDLER
CERTIFIED PUBLIC ACCOUNTANT
RENO, NEVADA

HON. EMMET D. BOYLE,
HON. L. B. FOWLER,
HON. A. J. STINSON,

January 10, 1921.

Industrial Commission Board, State of Nevada, Carson City.

GENTLEMEN: I have audited the accounts of the Nevada Industrial Commission for the two years ending June 30, 1920, and beg to submit this as my report.

Submitted herewith are statements as follows: .

Exhibit A—State Insurance Fund, Receipts and Disbursements, July 1, 1913, to June 30, 1920.

Exhibit B—State Insurance Fund, Assets and Liabilities, June 30, 1920.

Exhibit C—State Accident Benefit Fund, Receipts and Disbursements, July 1, 1917, to June 30, 1920.

Exhibit D—State Accident Benefit Fund, Assets and Liabilities, June 30, 1920.

Schedule 1—Cash, June 30, 1920.

Schedule 2—State Insurance Fund, Investments, June 30, 1920.

I hereby certify that they are correct and in accordance with the accounts of the Commission and that they correctly display the condition of the Funds. All receipts are accounted for and disbursements are evidenced by proper vouchers and correct accounting has been made.

Cash balances have been verified and securities owned by the State Insurance Fund are found to be in the hands of the State Treasurer.

Respectfully submitted,

GEO. K. EDLER,
Certified Public Accountant.

Exhibit A

NEVADA INDUSTRIAL COMMISSION

STATE INSURANCE FUND

Receipts and Disbursements—July 1, 1913, to June 30, 1920

RECEIPTS	To June 30, 1918	Two years ending June 30, 1920	Totals	Totals
Premiums collected	\$1,623,128.03	\$665,924.03	\$2,289,052.06	
Interest	19,073.62	53,259.36	72,332.98	
	\$1,642,201.65	\$719,183.39		\$2,361,385.04
DISBURSEMENTS				
Compensation paid	\$825,890.46	\$490,892.28	\$1,316,772.74	
Administration expense	159,253.75	57,581.14	216,834.89	
Furniture and equipment	9,188.35	1,075.17	10,263.52	
Premiums refunded		131,316.26	131,316.26	
	\$994,322.56	\$680,864.85		1,675,187.41
Balance in fund, June 30, 1920				\$686,197.63
DISTRIBUTED AS BELOW				
Cash (see Schedule No. 1)			\$92,616.39	
Investments (see Schedule No. 2)			593,581.24	
				\$686,197.63

Exhibit B

NEVADA INDUSTRIAL COMMISSION

STATE INSURANCE FUND

Assets and Liabilities—June 30, 1920

ASSETS		
Cash (see Schedule No. 1)		\$92,616.39
Investments (see Schedule No. 2)		593,581.24
Accrued interest		11,388.83
Furniture and equipment	\$10,263.52	
Less depreciation	4,143.36	
		6,120.16
Total assets		\$703,706.62
LIABILITIES		
Reserve for pensions allowed, estimate		\$377,321.77
Reserve for liability account of pending claims, estimate		112,646.07
Reserve fund		86,739.61
Premiums paid in advance		13,157.33
Unclaimed vouchers		1,895.06
Total liabilities		\$591,759.84
Assets in excess of liabilities		\$111,946.78

Exhibit C

NEVADA INDUSTRIAL COMMISSION

STATE ACCIDENT BENEFIT FUND

Receipts and Disbursements—July 1, 1917, to June 30, 1920

RECEIPTS	To June 30, 1918	Two Years Ending June 30, 1920	Totals	Totals
Premiums collected	\$29,654.13	\$69,000.42		\$98,654.55
DISBURSEMENTS				
Benefits paid	\$3,492.96	\$28,364.21	\$36,857.07	
Administration expense	2,611.12	6,602.87	9,213.99	
	\$11,103.98	\$34,967.08		\$46,071.06
Balance in fund June 30, 1920 (see Schedule No. 1)				\$52,583.49

Exhibit D

NEVADA INDUSTRIAL COMMISSION

STATE ACCIDENT BENEFIT FUND

Assets and Liabilities—June 30, 1920

ASSETS		
Cash (see Schedule No. 1)	\$52,583.49	
Total assets		\$52,583.49
LIABILITIES		
Reserve for liability account of pending claims, estimate	\$2,304.30	
Premiums paid in advance	4,713.90	
Total liabilities		6,918.20
Assets in excess of liabilities		\$45,664.99

Schedule No. 1

NEVADA INDUSTRIAL COMMISSION

CASH

June 30, 1920

State Treasurer	\$11,997.77	
Carson Valley Bank	24,702.11	
Auditor's petty cash	1,000.00	
Special Deposits:		
Farmers' Bank of Carson Valley, Minden	\$32,500.00	
Carson Valley Bank, Carson City	55,000.00	
Copper National Bank, Ely	10,000.00	
Scheeline Banking & Trust Co., Reno	10,000.00	
		\$107,500.00
Total		\$145,199.88

CASH RECONCILEMENT

State Insurance Fund	\$92,616.39	
State Accident Benefit Fund	52,583.49	
		\$145,199.88

Schedule No. 2

NEVADA INDUSTRIAL COMMISSION

STATE INSURANCE FUND

Investments—June 30, 1920

White Pine County 6% Lund School District bonds (par value \$5,200)	36,280.00
Massachusetts State 3½% bonds (par value \$50,000)	47,722.02
United States Liberty Loan bonds, 4¼% First Converted (par value \$47,000)	47,000.00
United States Liberty Loan bonds, 4¼% Second Converted (par value \$50,000)	50,000.00
United States Liberty Loan bonds, 4¼% Third (par value \$25,000)	25,000.00
United States Liberty Loan bonds, 4¼% Fourth (par value \$50,000)	50,000.00
United States Victory Loan 4¼% bonds (par value \$40,000)	40,000.00
Humboldt County 5¼% Refunding bonds (par value \$70,000)	70,000.00
Mississippi State 4¼% bonds (par value \$25,000)	25,548.10
Cuyahoga County, Ohio, 4¼% bonds (par value \$25,000)	25,622.23
Washoe County 5% Courthouse bonds (par value \$2,000)	2,000.00
Churchill County 5% High School bonds (par value \$25,000)	25,000.00
Esmeralda County 6% Emergency bonds (par value \$8,000)	8,000.00
Mineral County 6% Highway bonds (par value \$27,000)	27,225.00
Ormsby County 5¼% Courthouse bonds (par value \$70,000)	70,000.00
Elko County 6% High School bonds (par value \$24,000)	24,237.89
City of Reno 5¼% Improvement bonds (par value \$50,000)	50,000.00
Total	\$593,581.21

STATE OF NEVADA

BIENNIAL REPORT

OF THE

Nevada State Racing Commission

1919-1920

GEORGE WINGFIELD, Chairman



CARSON CITY, NEVADA

STATE PRINTING OFFICE

: : : : :

JOE FARNSWORTH, SUPERINTENDENT

1921



SECOND BIENNIAL REPORT OF THE STATE RABIES COMMISSION

To His Excellency, HON. EMMET D. BOYLE, Governor of Nevada.

SIR: We submit herewith the second biennial report of the State Rabies Commission covering work of same for the years 1919-1920, with the suggestion that it be published for the information of the people of the State.

ORGANIZATION

The personnel of the Commission, which is really ex officio in nature, has remained unchanged since the rendering of the last biennial report, as follows:

Governor Emmet D. Boyle.....	Chairman
Hon. H. F. Dangberg.....	State Board of Stock Commissioners
Hon. John G. Taylor.....	State Board of Stock Commissioners
Dr. Walter H. Hood.....	State Board of Health
Dr. Edward Records, Director State Veterinary Control Service.....	Secretary of the Commission

Mr. E. R. Sans, of the Bureau of Biological Survey, United States Department of Agriculture, has remained in charge of the local office of the Bureau in Nevada. The actual work of the Commission in predatory animal eradication and rodent control has been carried on under his immediate direction and supervision.

The various tabulations included in this report give in a complete but concise manner a statement of the work done, results accomplished, expenditures from state and federal funds, and some data as to the prevalence of rabies in the State.

CONTROL OF PREDATORY ANIMALS

During the last biennium there have been employed on an average about seventy hunters. These men devoted their time to trapping, poisoning and den-hunting of predatory animals. A few fur-bearing animals were taken in traps set for predatory animals and when the fur was prime these were turned into the office, but in the summer months when the animals were not injured, they were turned loose. The predatory animals against which most of the work has been directed are the mountain-lion, bobcat, and coyote, especially the latter, as they are one of the principal distributors of rabies among domesticated animals and human beings.

POISONING

It has been found by experimenting with different methods of poisoning that where poisoning campaigns can be conducted without interfering with domesticated dogs, one can clean up a given area much quicker and with less expense than with traps. In such campaigns one may not be able to locate many of the poisoned animals as they often travel great distances after they have taken poison-baits, but enough of them are found to prove the effectiveness of the method. During the two years there have been distributed 50,000 poison-baits.

As the federal and state funds were appropriated expressly for the

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NUMBER OF PATIENTS GIVEN THE PASTEUR PREVENTION OF RABIES AT THE STATI TORY DURING THE YEARS 1915-1920, INCLU	
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1916.....	
1917.....	
1918.....	
1919.....	
1920.....	
Total.....	

CONDITIONS AND PROGRES

Owing to war conditions and the high prices furs there was experienced considerable difficulty in getting reliable men, but in the last two or three years has improved so that there are now numerous applicants by reliable and experienced men.

The work has received hearty support and encouragers and many of the hunters are provided with material and often even subsistence is furnished assistance in carrying on the work.

Gratifying progress in the control of rabies by looking to that end is indicated by the following for the entire period since the disease established its

RODENT CONTROL

The burden of rodent work has largely fallen on the Commission as federal funds cannot be used on privately-owned land. As numerous requests were received from ranchers who were being eaten the Commission decided to prepare and furnish to the ranchers within the State of Nevada reliable poisoned grain under the personal supervision of the Inspector in charge at a cost of five cents per pound. This poisoned grain was furnished only on a tabulation properly signed by the applicant and its use was verified by the tabulation of the amounts furnished in each year. The money received for this poisoned grain was turned back to the ranchers as a refund. The money expended from federal funds for the employment of a Rodent Inspector to demonstrate the spreading of the poisoned grain in the various coming years was prepared poisoned grain that was to be used on adjacent to privately-owned property where the owner was unable to clean up the rodents.

The actual cost of this grain was 16 3-7 cents per bushel, the difference between the cost and selling price being borne by the state funds. The money received from the sale of the grain was turned back into the appropriation and was available for other purposes.

In the Metropolis District, the ranchers got together and formed an association to cooperate with the state and federal

control the rodents on about 26,000 acres. They assessed themselves five cents an acre for uncultivated lands and ten cents an acre for cultivated areas and a foreman was appointed to take charge of this work. He was placed in charge of a crew of four men who covered the federal, railroad and privately-owned lands with wonderful success, demonstrating without a doubt what concentrated efforts will do in controlling the rodents. The County Agent estimated that \$75,000 was saved in the Metropolis District alone by this rodent campaign, which was conducted in 1920.

DISTRIBUTION OF POISONED GRAIN

	Pounds	Returns at 5 cts. per lb.
Churchill County	680	\$34.00
Clark County .....	.....	.....
Douglas County	150	7.50
Elko County	104,956	5,247.80
Esmeralda County	20	1.00
Eureka County	3,758	187.90
Humboldt County	10,623	531.15
Lander County	1,520	76.00
Lincoln County	34	1.70
Lyon County	443	22.15
Mineral County .....	.....	.....
Nye County	450	22.50
Ormsby County .....	.....	.....
Pershing County	5,175	258.75
Storey County .....	.....	.....
Washoe County	2,197	109.85
White Pine County	20	1.00
Totals	130,026	\$6,501.30

EXPENDITURES FROM STATE FUNDS

<i>Predatory Animal Control</i>	1919	1920	Total
Hunters salaries	\$13,013.33	\$24,522.50	
Clerk hire	1,029.50	543.84	
Auto mileage	16.20	5.00	
Industrial Insurance	179.57	375.99	
Miscellaneous equipment .....	.....	285.00	
Totals	\$14,238.60	\$25,732.33	\$39,970.93
<i>Rodent Control</i>			
Salaries of field men	\$40.00	\$1,190.67	
Strychnine and saccharine	12,271.70	6,804.55	
Industrial Insurance .....	.60	17.86	
Poison supplies	351.14	195.05	
Poison grain containers	556.58	691.25	
Grain	3,465.87	3,509.34	
Express and drayage	136.94	193.80	
Miscellaneous supplies and exp. ..	130.79	347.10	
Rent	157.50	425.00	
Auto mileage	3.90	.....
Miscellaneous equipment	15.00	.....
Insurance on poison grain	60.00	60.00	
Totals	\$17,190.02	\$13,454.62	\$30,624.64

EXPENDITURES FROM FEDERAL FUNDS

<i>Predatory Animal Control</i>	1919	1920
Salaries of hunters	\$45,235.51	\$36,102.3
Rent and supplies	1,527.67	2,522.5
Administrative expenses	1,970.00	4,323.3
Totals	\$48,733.18	\$42,948.1
<i>Rodent Control</i>		
Miscellaneous supplies	\$2,040.00	\$2,758.1
Administrative expenses	1,080.00	762.5
Totals	\$3,120.00	\$3,520.6

Grand total of expenditures of State and Federal Funds.

RECAPITULATION OF EXPENDITURES, 1919-

	<i>Rodent Control</i>	<i>Predatory Animal Control</i>
State funds	\$30,624.64	\$39,970.93
Federal funds	6,640.60	91,681.35
Totals	\$37,265.24	\$131,652.28

FINANCIAL STATEMENT**(State Funds)**

March 1, 1919, State appropriation.....	\$35,000.00
March 1 to December 31, 1919, expenses.....	
From sale of poison grain during 1919.....	1,950.00
Unexpended balance December 31, 1919.....	
January 1, 1920, State appropriation.....	35,000.00
January 1 to December 31, 1920, expenses.....	
From sale of poison grain during 1920.....	4,616.85
Unexpended balance December 31, 1920.....	
	\$76,566.85

NET COST TO STATE

	<i>Rodent Control</i>	<i>Predatory Animal Control</i>
Total expenses	\$30,624.64	\$39,970.93
Poison grain sales	6,566.85	
Fur sales		10,947.80
Total receipts		
Actual net cost	\$24,057.79	\$29,023.13

The actual net cost shown above takes into account from poisoned grain and furs actually sold up to December 31, 1920. There are still in the hands of the Commission about 65,159 pounds of grain, with an estimated value of \$2,500, and 65,159 pounds of furs. If these two items were taken into account, the figure quoted would be even lower.

The funds appropriated for this work have been used for salaries of hunters and supplies purchased for the mixing of poison grain. The Commissioners and Secretary are giving no salaries without compensation and the immediate supervision of

REPORT OF RABIES COMMISSION
under government charge and the salary of the Inspector is paid from government funds.

CONCLUSION

In conclusion we wish to express our appreciation of the continued interest shown by the officials of the Bureau of Biological Survey, United States Department of Agriculture, and especially of the service rendered by Mr. E. R. Sans, who has been in direct charge of the work in this State, and to whose efforts the results accomplished are largely due.

We also wish to thank the members of the livestock industry and the general public for support and encouragement given this work and for the many suggestions made which have helped to make its prosecution in remote districts possible.

Respectfully submitted,

STATE RABIES COMMISSION,

EDWARD RECORDS, *Secretary.*



STATE OF NEVADA

REPORT OF SUPERINTENDENT

OF THE

Nevada Hospital for Mental Diseases

1919-1920

R. H. RICHARDSON, M.D., Superintendent



CARSON CITY, NEVADA

STATE PRINTING OFFICE

: : : : :

JOE FARNSWORTH, SUPERINTENDENT

1921

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LETTER OF TRANSMITTAL

CARSON CITY, NEVADA, January 2, 1921.

HON. EMMET D. BOYLE, *Governor of Nevada.*

DEAR SIR: I have the honor herewith to transmit the report of the Hospital for Mental Diseases at Reno, Nevada, for the years 1919 and 1920.

Yours respectfully,

J. H. MYLES,

Secretary of Board of Commissioners for Care of Indigent Insane.

**BOARD OF COMMISSIONERS
FOR THE CARE OF THE INDIGENT INSANE**

EMMET D. BOYLE (Governor).....	Carson City
GEO. A. COLE (State Controller).....	Carson City
ED. MALLEY (State Treasurer).....	Carson City
J. H. MYLES, <i>Secretary</i>	Carson City

BUILDINGS NEEDED

Two additional buildings, to accommodate forty patients each, are urgently needed, and will constitute the quota assigned for construction in 1921 and 1922. These are estimated to cost, furnished, \$40,000 each. These, with the treatment building (the most expensive planned), with the retention and operation of the present woman's building, will accommodate 225 patients, which would seem ample for the needs of the near future. In this connection, I wish to call your attention to the advisability of remodeling the stone house so that it can be used as quarters for the employees, especially for the attendants and nurses, who so much need a respite from their exacting duties and a place where for twelve hours in the day they may be removed from depressing surroundings. At present they have to sleep in the wards, and virtually are with their patients day and night. When the facilities justify, we will have them work in two shifts. Few can stand the work as carried on here for any considerable time without mental and physical breakdown. The employees, as well as the patients, should be treated humanely. For other matters of building and repair, you are referred to a subjoined letter, concerning the budget, to the Governor.

COMMISSARY AND SUPPLIES

The middle of May, 1919 (the date of my appointment), found the Hospital with no supplies in the commissary and urgent need for clothing, shoes, blankets, sheets, and pillow cases. Three hundred army blankets, costing \$1,440, and \$403.82 worth of sheeting had to be bought at once. Now we have a fair supply of sheets, pillowcases, towels, etc., that will need only moderate replenishing.

FARM AND GARDEN

The results from the farm and garden are very gratifying. All that is expected is that an abundance of vegetables for use throughout the year be produced, and enough provender grown to support a dairy.

The farm has been surveyed and a plat made showing the 1920 cultivation of each parcel. The whole cultivatable land was found to be 155 acres. In addition, we rent about 40 acres of pasture at an annual rental of \$700. This is a fine farm, though too small for our needs; the soil is a light sandy loam that will grow everything suited to the climate in fair quantities—about 3 tons of alfalfa hay, 7 tons of potatoes, and 20 tons of onions, representing yields per acre for 1920. With better fertilization we expect better results in production of hay, sufficient for a dairy herd that will furnish the Hospital a minimum of 125 gallons of milk a day. For the last two months two four-horse teams have been hauling manure from the race-track and stock-yards. This will be continued until spring, or until the supply is exhausted. This work, with clearing land of rocks, keeps the farm force employed from fall to planting time. Formerly, a carload of cordwood was purchased for use in bakery and kitchen every two months. Enough timber was cut from the place during the last year to eliminate this expense. The dairy (increased by ten good cows purchased early in the term for \$1,255) furnishes an average of 75 gallons of milk a day, supplying the butter used, but not providing enough whole milk for our patients. The herd will gradually be built up, but the process is too slow, and I am

recommending the purchase of twelve more cows. For farm and dairy, the following articles were purchased during the term: Potato planter, mower, two wagon bodies, milker, ensilage cutter, one two-way plow; total cost, \$965.50. A concrete cellar, 25x72, constructed by our own labor, except \$253.50 paid to carpenters, at a total cost of \$1,487.20, now contains about 80 tons of onions, in addition to other vegetables. The onions will be sold when the market price is better. Referring to table "Farm Contingent Fund Receipts," it will be seen that \$2,939.31 accounts for farm products in excess of our need which were sold. Additional credits to this fund are 90 tons of onions and 25 tons of potatoes in excess, now on hand to be marketed.

HOSPITAL TREATMENT OF PATIENTS

In the first place, our patients have been well fed; every effort is made to furnish variety, as well as nourishing food. The sick are given special diet, and are made as comfortable as the medical staff, nurses, and attendants can make them. It would be difficult to improve upon our present force; all are working conscientiously for the betterment and comfort of these unfortunates, but I regret to state that they are poorly paid for the long nerve-racking hours of labor. A great deal of time and energy have been spent during the eighteen months of my superintendency in making records of the physical and mental examinations of all patients. Wasserman tests were made to determine the presence or absence of syphilitic infection in all cases when doubt existed or confirmation was desired. Individual cases to the number of 195 were thus examined and, as treatment progressed, many control tests were made. For this laboratory work we are indebted to Dr. Ruediger of the Bacteriological Department of the State University. In obtaining the personal history of patients committed during the term, the District Judges throughout the State were appealed to in a circular letter, asking for more detail of personal history than had formerly been given in commitments; also, that a complete stenographic report of the court proceedings in each case be forwarded. It is gratifying to record that all the Judges have generously acted upon and given importance to these requests.

Dr. Robert Ostroff has acted as Resident Physician, and his skill as a surgeon has enabled the medical staff to perform all necessary surgery in a satisfactory manner. A competent trained nurse has been employed during my incumbency. The justification of the expense of these new appointments, I think, is amply shown by the results accomplished. The present facilities are very poor for hydrotherapeutic treatment, but an improvised outfit has been installed, and this work has been carried on under difficulty. The large percentage of syphilitics among these patients entails continued work over a long period before results can be tabulated. Too much credit is given by the public to "Salvarsan" as a cure for syphilis, thinking that a few inter-venous injections of this drug is all that is needed. This impression needs correction, and the fact that tertiary syphilis is not cured by its use alone should be made plain to physicians and laity. The importance of the care of the teeth has not been overlooked, but money has not been available for the pay for much dentistry. This should be corrected.

The failure of the Harrison Act in limiting the use of habit-forming drugs is generally recognized. States and municipalities are endeavoring to devise plans to control this growing evil, and this State must do its part in protecting its people and in the care and treatment of the drug addict. For this purpose, I believe that this institution is best fitted to handle our part of the problem. The courts should be given the power to commit drug addicts to this hospital for six months, or such shorter time as may be necessary to effect a cure. Only in a place where complete restraint and supervision can be exercised will proper results be obtained, and this is the only institution in the State to which such work should be entrusted. I hope this Legislature will take action in this serious matter and make an appropriation to care for the additional expense.

Our experience here has shown the advisability of giving the Superintendent authority to admit emergency cases. In a few instances, occurring in Reno and vicinity, I have been solicited by the authorities to take the insane from the jails for temporary care, until such a time as would be required by the court in making a regular commitment. Under the present laws no discretion is allowed, and I think this should be corrected by a law permitting the Superintendent to take to the Hospital such a case for a period not to exceed ten days, the patient to be discharged at the end of that time if not regularly committed by the courts. Two things dictate such a course—humanity, and the knowledge that early treatment is most effective.

I do not think I can be accused of undue optimism in my belief that the Hospital can and will be made as efficient as any in the country and should do better work because of the smaller number of patients. The lack of interest of the public in the affairs of this institution is to be deplored. The fact remains that a place for the treatment of the insane will have to be maintained and every effort should be made to have the State Hospital function properly.

STATISTICAL TABLES

TABLE I

Movements of population—Admission, discharges, deaths, and escapes

1919	Admissions			Discharges			Deaths			Escapes		
	M	W	T	M	W	T	M	W	T	M	W	T
January.....	4	1	5	1	0	1	4	1	5	0	0	0
February.....	5	0	5	1	0	1	1	1	2	0	0	0
March.....	0	0	0	2	0	2	0	1	1	1	0	1
April.....	3	0	3	2	0	2	0	0	0	2	0	2
May.....	3	3	6	2	1	3	4	1	5	2	0	2
June.....	2	1	3	5	0	5	1	0	1	0	0	0
July.....	2	2	4	0	0	0	1	0	1	0	0	0
August.....	5	3	8	1	1	2	2	1	3	1	0	1
September.....	3	2	5	3	1	4	0	0	0	0	0	0
October.....	4	1	5	0	0	0	4	0	4	0	0	0
November.....	1	1	0	2	0	2	1	0	1	0	0	0
December.....	6	0	6	1	1	2	0	1	1	1	0	1
Totals.....	38	14	52	20	4	24	18	6	24	7	0	7
1920												
January.....	4	0	4	1	0	1	0	0	0	0	0	0
February.....	0	1	1	0	0	0	1	0	1	0	0	0
March.....	1	0	1	6	0	6	1	0	1	0	0	0
April.....	5	0	5	2	0	2	0	0	0	0	0	0
May.....	3	2	5	2	1	3	0	0	0	0	0	0
June.....	4	0	4	1	3	4	1	0	1	2	0	2
July.....	6	0	6	2	0	2	1	0	1	1	0	1
August.....	4	3	7	0	0	0	0	0	0	1	0	1
September.....	3	1	4	1	1	2	1	0	1	2	0	2
October.....	2	1	3	3	0	3	0	1	1	0	0	0
November.....	2	1	3	3	0	3	2	0	2	0	0	0
December.....	0	1	1	1	1	2	3	0	3	0	0	0
Totals.....	34	10	44	22	6	28	10	1	11	6	0	6

TABLE II

Daily Average

1919	Men	Women	Totals	1920	Men	Women	Totals
January.....	165.06	69.50	234.56	January.....	144.87	59.00	203.87
February.....	164.15	68.75	233.50	February.....	145.00	59.27	204.27
March.....	165.55	69.00	234.55	March.....	136.00	60.00	190.00
April.....	161.10	68.75	229.85	April.....	134.10	60.00	194.10
May.....	160.06	68.29	228.35	May.....	140.00	61.00	201.00
June.....	147.76	67.00	214.76	June.....	141.33	60.25	201.58
July.....	147.42	67.22	204.64	July.....	142.00	59.83	201.73
August.....	147.22	67.32	214.54	August.....	145.00	62.13	207.13
September.....	146.66	66.60	213.26	September.....	143.00	63.00	206.00
October.....	143.22	64.00	207.22	October.....	142.00	62.33	204.33
November.....	138.73	63.50	202.23	November.....	136.30	61.00	197.30
December.....	141.10	63.09	204.19	December.....	136.00	64.00	200.00
Total average.....	152.38	66.91	218.47	Total average.....	142.18	60.98	203.16

TABLE III

Showing age of those committed during the term

	Men	Women	Totals
15 to 20 years of age.....	1	1	2
20 to 25 years of age.....	3	0	3
25 to 30 years of age.....	7	4	11
30 to 35 years of age.....	12	5	17
35 to 40 years of age.....	9	1	10
40 to 45 years of age.....	10	4	14
45 to 50 years of age.....	7	1	8
50 to 60 years of age.....	8	2	10
60 to 70 years of age.....	7	0	7
70 to 80 years of age.....	0	3	3
80 to 90 years of age.....	8	3	11
Totals.....	72	24	96

TABLE IV
Showing duration of disease before admission

	Men	Women	Totals
Under 1 month.....	23	7	30
From 1 to 3 months.....	10	0	10
From 3 to 6 months.....	6	0	6
From 6 to 9 months.....	7	1	8
From 9 months to 1 year.....	1	0	1
From 1 to 2 years.....	5	5	10
From 2 to 3 years.....	2	0	2
From 3 to 4 years.....	0	2	2
From 4 to 5 years.....	1	0	1
From 5 to 10 years.....	1	0	1
From 10 to 20 years.....	3	2	5
Unknown.....	13	7	20
Totals.....	72	24	96

TABLE V
Showing age at which insanity made its first appearance

	Men	Women	Totals
From 15 to 20 years of age.....	1	2	3
From 20 to 25 years of age.....	5	1	6
From 25 to 30 years of age.....	6	2	8
From 30 to 35 years of age.....	8	3	11
From 35 to 40 years of age.....	7	1	8
From 40 to 45 years of age.....	10	4	14
From 45 to 50 years of age.....	7	3	10
From 50 to 60 years of age.....	7	2	9
From 60 to 70 years of age.....	6	0	6
From 70 to 80 years of age.....	2	3	5
From 80 to 90 years of age.....	5	0	5
Unknown.....	8	3	11
Totals.....	72	24	96

TABLE VI
Occupations of those admitted during the term

	Men	Women	Totals
Laundress.....	1	1	2
Laundry worker.....	1	1	2
Dentist.....	2	0	2
Laborer.....	23	0	23
Miner.....	8	0	8
Painter.....	1	0	1
Ranch-hand.....	4	0	4
Housewife.....	0	15	15
Engineer.....	3	0	3
Farmer.....	9	0	9
Civil engineer.....	1	0	1
Cook.....	1	0	1
Barber.....	1	0	1
Lumberman.....	1	0	1
Shepherd.....	2	0	2
Machinist.....	2	0	2
Blacksmith.....	1	0	1
Merchant.....	1	0	1
Saloon-keeper.....	1	0	1
Clerk.....	1	0	1
Gambler.....	1	0	1
Unknown.....	9	8	17
Totals.....	72	24	96

TABLE VII
Residence by counties of patients admitted during the term

	<i>Men</i>	<i>Women</i>	<i>Totals</i>
Pershing	3	0	3
Elko	8	2	10
Emeralda	3	0	3
Nye	5	5	10
Ormsby	2	1	3
Humboldt	2	1	3
Churchill	5	1	6
Lander	2	0	2
Washoe	22	9	31
Storey	1	0	1
Lyon	0	1	1
Clark	5	2	7
White Pine	7	1	8
Mineral	3	1	4
Douglas	2	0	2
Lincoln	1	0	1
Eureka	1	0	1
Totals	72	24	96

TABLE VIII
Nativity of those admitted during term

	<i>Men</i>	<i>Women</i>	<i>Totals</i>
United States	37	19	56
Ireland	1	1	2
Italy	4	2	6
Germany	3	0	3
Canada	1	0	1
Sweden	2	0	2
Spain	2	0	2
Austria	1	0	1
Japan	1	0	1
Scotland	1	0	1
Greece	2	0	2
England	2	0	2
Portugal	1	0	1
China	2	1	3
Denmark	1	0	1
France	1	0	1
Unknown	7	1	8
Luxembourg	1	0	1
Mexico	2	0	2
Totals	72	24	96

TABLE IX
Showing civil condition of those in Hospital at close of the term

	<i>Men</i>	<i>Women</i>	<i>Totals</i>
Married	17	13	30
Single	32	5	37
Widowed	5	4	9
Divorced	5	0	5
Unknown	13	2	15
Totals	72	24	96

TABLE X
Showing duration of treatment of those discharged during the term

	<i>Men</i>	<i>Women</i>	<i>Totals</i>
Under 1 month	18	2	20
From 1 to 3 months	15	3	18
From 3 to 6 months	5	3	8
From 6 to 12 months	2	0	2
From 1 to 2 years	1	1	2
From 2 to 5 years	1	0	1
Totals	42	9	51

TABLE XI

Showing duration of cases of those who died during the term

	Before admission			Hospital residence			Entire duration		
	M	W	T	M	W	T	M	W	T
Less than 1 month.....	9	2	11	7	0	7	5	0	5
From 1 to 3 months.....	1	1	2	4	2	6	2	0	2
From 3 to 6 months.....	2	0	2	6	0	6	1	0	1
From 6 to 9 months.....	0	0	0	1	0	1	1	0	1
From 9 to 12 months.....	1	1	2	0	0	0	2	0	2
From 1 to 2 years.....	3	0	3	1	0	1	5	2	7
From 2 to 3 years.....	1	0	1	1	0	1	1	1	2
From 3 to 5 years.....	1	0	1	2	2	4	3	0	3
From 5 to 10 years.....	0	0	0	2	0	2	1	0	1
From 10 to 20 years.....	0	0	0	2	2	4	2	2	4
From 20 to 30 years.....	0	0	0	1	0	1	1	0	1
From 30 to 50 years.....	0	0	0	2	0	2	2	0	2
Unknown.....	11	2	13	0	0	0	3	1	4
Totals.....	29	6	35	29	6	35	29	6	35

TABLE XII

Showing duration of hospital residence of those who died during them

	Men	Women	Totals
Less than 1 month.....	7	0	7
From 1 to 3 months.....	4	3	7
From 3 to 6 months.....	7	0	7
From 6 to 9 months.....	1	0	1
From 1 to 2 years.....	1	1	2
From 2 to 3 years.....	1	0	1
From 3 to 5 years.....	2	1	3
From 5 to 10 years.....	1	0	1
From 10 to 20 years.....	2	1	3
From 20 to 30 years.....	1	0	1
From 30 to 50 years.....	2	0	2
Totals.....	29	6	35

TABLE XIII

Showing cause of death of those who died during term

	Men	Women	Totals
Senile dementia.....	3	1	4
Suicide.....	0	1	1
Mania, recurrent.....	1	0	1
Paresis.....	1	0	1
Unknown (no record).....	3	0	3
Cerebral hemorrhage.....	0	1	1
Malnutrition.....	1	0	1
Exhaustion from acute mania.....	1	0	1
Pneumonia.....	3	0	3
Pulmonary tuberculosis.....	0	1	1
Tertiary syphilis.....	4	0	4
Interstitial nephritis.....	1	0	1
Chronic myocarditis.....	2	1	3
Chronic nephritis.....	1	0	1
Gunshot wound.....	1	0	1
Cerebral spinal lues.....	1	0	1
Chronic nephritis tuberculosis.....	0	1	1
Valvular heart disease.....	1	0	1
Totals.....	29	6	35

TABLE XIV
Representation by counties at close of term

	<i>Men</i>	<i>Women</i>	<i>Totals</i>
Washoe	40	27	67
Humboldt	11	4	15
Eureka	6	3	9
Elko	21	6	27
Storey	2	4	6
Ormsby	17	4	21
Churchill	3	1	4
White Pine	11	1	12
Lincoln	2	0	2
Lyon	2	1	3
Douglas	3	0	3
Clark	3	1	4
Esmeralda	7	2	9
Nye	6	9	15
Mineral	1	0	1
Lander	1	1	2
Totals	136	64	200

TABLE XV
Giving age at death of those who died during the term

	<i>Men</i>	<i>Women</i>	<i>Totals</i>
From 20 to 30 years	0	2	2
From 30 to 40 years	3	0	3
From 45 to 50 years	2	1	3
From 50 to 55 years	0	1	1
From 55 to 60 years	6	0	6
From 60 to 65 years	3	0	3
From 65 to 70 years	5	0	5
From 70 to 80 years	3	1	4
From 80 to 90 years	4	1	5
Unknown	3	0	3
Totals	29	6	35

TABLE XVI
Diagnosis of cases in Hospital, December 31, 1920

	<i>Men</i>	<i>Women</i>	<i>Totals</i>
Maniac depression and allied psychoses	21	12	33
Paresis	25	7	32
Dementia precox and allied psychoses	26	11	37
Organic psychoses	10	9	19
Involution psychoses	9	4	13
Intoxication psychoses	8	2	10
Paranoia	14	7	21
Unclassified	8	2	10
Infection exhaustion psychoses	6	8	14
Psychopathic psychoses	5	2	7
Not insane	3	1	4
Totals	135	65	200

Discharged during the years of 1910 and 1911		Men	Women	Totals
Diagnosis—				
Paranoia	0	4	4	
Senile dementia	5	1	6	
Depressive mania	1	0	1	
Cerebral syphilis	0	1	1	
Paretic	1	0	1	
Acute mania	1	0	1	
Chronic nephritis	0	1	1	
Cause of Death—				
Syphilis	3	0	3	
Chronic myocarditis	3	1	4	
Pneumonia	1	0	1	
Chronic nephritis	2	0	2	
Cerebral syphilis	0	1	1	
Bright's disease, cardinal insufficiency	1	0	1	
Tertiary syphilis	2	1	3	
Pulmonary tuberculosis	0	1	1	
Terminal pneumonia	1	0	1	
Cerebrospinal syphilis	1	0	1	
Chronic myocarditis, cardio-renal diseases	1	0	1	
Exhaustion of acute mania	1	0	1	
Tuberculosis	1	0	1	
Suicide	0	1	1	
Diagnosis of Those Discharged—				
Depressive mania	4	0	4	
Paretic	2	0	2	
Paranoia	2	2	4	
Acute mania	5	0	5	
Syphilis	3	0	3	
Dementia precox	1	0	1	
Morphine addict	1	1	2	
Cerebral syphilis	1	1	2	
Senile dementia	1	0	1	

TABLE XVIII

Showing average number of patients employed, and how employed

	<i>Dining-</i>		<i>Needle-</i>					
	<i>Kitchen</i>	<i>Laundry room</i>	<i>Halls</i>	<i>work</i>	<i>Grounds</i>	<i>Men</i>	<i>Women</i>	<i>Totals</i>
<i>1919</i>								
January.....	8.88	9.70	20.41	45.38	8.61	9.38	63.67	103.57
February.....	8.24	10.64	20.64	46.71	8.28	7.32	60.19	110.19
March.....	6.74	10.16	19.96	47.22	8.38	13.25	68.58	108.58
April.....	7.06	10.00	19.70	47.73	8.16	13.64	69.10	109.10
May.....	6.96	9.51	20.48	50.03	8.41	10.74	66.61	106.44
June.....	6.06	10.06	22.32	49.67	8.48	15.96	72.83	110.73
July.....	6.50	8.50	23.25	52.48	8.71	17.80	77.32	117.12
August.....	6.08	4.93	26.41	53.00	9.29	17.36	76.64	114.14
September.....	5.09	5.50	28.00	45.64	8.83	21.93	72.03	107.04
October.....	3.87	3.93	24.22	44.20	8.67	18.36	75.22	110.51
November.....	6.03	4.87	23.67	41.45	7.80	17.06	68.83	101.86
December.....	7.03	5.06	25.00	41.35	8.50	14.83	69.06	102.31
<i>1920</i>								
January.....	6.54	3.50	24.03	41.30	9.74	17.51	70.15	103.86
February.....	7.00	4.20	23.00	40.35	7.00	18.60	68.20	101.92
March.....	7.61	4.25	23.32	40.09	5.91	15.30	66.45	98.63
April.....	7.60	3.53	23.50	35.80	8.64	15.16	65.77	92.93
May.....	6.16	3.35	26.71	40.77	8.25	18.25	72.64	106.64
June.....	7.00	4.96	25.56	38.54	7.16	19.09	73.00	105.16
July.....	7.09	4.16	25.83	40.45	9.16	10.22	78.19	97.51
August.....	7.00	4.25	26.09	41.48	6.96	15.95	72.25	106.58
September.....	7.00	3.90	24.96	37.54	5.74	24.29	72.36	104.19
October.....	6.41	3.00	26.58	40.12	7.09	26.03	74.98	107.10
November.....	7.00	3.70	25.26	35.16	5.90	18.50	70.37	101.63
December.....	7.00	3.00	26.50	34.00	5.50	17.30	68.50	99.50
Total averages.....	6.72	5.77	23.97	42.95	7.88	16.41	70.53	105.28

TABLE XIX

Movements of population since opening of the Hospital—Gains, losses, daily averages, and daily costs per patient

Term	Gains, admissions			Losses, discharges, etc.			Daily average			Per capita cost per day, whole	Per capita cost per day, maintenance	Superintendents
	Male	Female	Total	Male	Female	Total	Male	Female	Total			
January 1, 1882	117	31	148	27	4	31	114.80	35.18	114.65	89.00	74.00	A. Dawson, M.D.
December 31, 1882	20	8	28	50	8	58	149.98	38.04	149.98	79.80	67.50	S. Bishop, M.D.
1883 and 1884	48	16	64	47	7	54	121.66	38.04	169.70	68.92	62.91	S. Bishop, M.D.
1885 and 1886	48	7	55	47	7	54	124.63	37.10	161.73	80.91	63.96	S. Bishop, M.D.
1887 and 1888	49	8	57	43	10	53	124.84	39.24	174.08	66.33	67.37	S. Bishop, M.D.
1889 and 1890	50	14	64	43	7	50	138.59	43.00	181.59	81.86	64.87	S. Bishop, M.D.
January 1, 1891	52	0	52	2	0	2	141.34	42.72	184.06	61.77	49.26	G. H. Thoma, M.D.
February 7, 1891	54	12	66	51	15	66	143.53	43.50	187.03	50.34	—	G. H. Thoma, M.D.
March 31, 1891, to December 31, 1892	46	18	64	41	14	55	148.51	44.70	193.11	48.17	—	H. Bergstein, M.D.
1893 and 1894	46	17	63	46	16	62	148.10	48.05	194.15	48.19	—	H. Bergstein, M.D.
1895 and 1896	48	17	65	49	19	68	146.10	48.43	182.53	52.01	—	W. H. Patterson, M.D.
1897 and 1898	34	22	56	38	11	49	134.13	51.82	189.80	50.79	—	W. H. Patterson, M.D.
1899 and 1900	34	12	46	38	10	48	137.88	57.50	197.77	—	—	S. C. Gibson, M.D.
1901 and 1902	47	18	65	38	10	48	140.27	52.58	198.81	53.91	—	S. C. Gibson, M.D.
1903 and 1904	38	18	56	52	17	69	136.23	55.70	207.87	58.12	—	S. C. Gibson, M.D.
1905 and 1906	70	21	91	52	27	79	159.17	61.37	224.74	56.07	—	J. A. Lewis, M.D.
1907 and 1908	71	27	98	69	17	86	163.87	62.07	239.99	52.81	—	J. A. Lewis, M.D.
1909 and 1910	80	28	108	67	27	94	177.92	62.07	239.99	52.81	—	John J. Sullivan, A. M., M.D.
1911 and 1912	84	20	104	81	16	97	171.07	64.33	235.40	54.11	—	John J. Sullivan, A. M., M.D.
1913 and 1914	86	26	112	103	30	133	163.87	70.45	245.83	60.53	—	R. H. Richardson, M.D.
1915 and 1916	98	28	126	79	21	100	175.38	66.00	218.00	175.38	—	—
1917 and 1918	104	42	146	83	19	102	162.00	—	—	—	—	—
1919 and 1920	72	24	96	83	19	102	162.00	—	—	—	—	—

	Men	Women	Totals
Patients remaining over December 31, 1918.....	166	70	236
Admitted during term of 1919-1920.....	72	24	96
Whole number treated during term.....	238	94	332
Decrease in population during term.....	102	28	130
Escaped	136	64	200
Discharged	9	0	9
Died	42	9	51
Paroled	29	6	35
Paroled	8	4	7
Total decrease in population during term.....	83	19	102
Maximum number within term (average).....	160	69	229
Minimum number within term.....	137	59	196
Daily average of patients during term.....	162	66	218
Percentage of recoveries to total number treated.....	.....	.....	.153
Percentage of deaths to total number treated.....	.....	.....	.111

Movements of population from opening of Hospital, July 1, 1882

Total number of admissions.....	1,746
Total number of discharges.....	741
Total number of deaths.....	724
Percentage of deaths to total number admitted.....	.415

TABLE XXI
Occupation of those in Hospital at close of the term

	Men	Women	Totals
Laborer	60	0	60
Shepherdherder	4	0	4
Miner	14	0	14
Millwright	1	0	1
Painter	2	0	2
Blacksmith	2	0	2
Farmer	10	0	10
Rancher	6	0	6
Stone mason.....	1	0	1
Stage driver.....	1	0	1
Clerk	1	0	1
Cook	3	0	3
Tailor	1	0	1
Student	1	0	1
Dishwasher	1	0	1
Barber	2	0	2
Prospector	3	0	3
Telephone operator	1	0	1
Machinist	2	0	2
Teamster	1	0	1
Engineer	2	0	2
Wood-chopper	1	0	1
Waiter	1	0	1
Saloon-keeper	1	0	1
Shoemaker	1	0	1
Laundryman	1	0	1
Musician	1	0	1
None	5	18	23
Unknown	6	0	6
Housewife	0	33	33
Housework	0	9	9
Clerk	0	1	1
Laundress	0	2	2
Teacher	0	1	1
Totals.....	136	64	200

TABLE XXII
Showing civil condition of those in Hospital at close

Married	
Single	
Divorced	
Widowed	
Widower	
Unknown	
Totals	

TABLE XXIII
Nativity of patients in Hospital at close of the

United States	
Italy	
Spain	
Canada	
Ireland	
England	
Norway	
Russian Poland	
Spanish Basque	
Austria	
Sweden	
China	
Germany	
Mexico	
Greece	
Japan	
Turkey	
Peru	
Portugal	
Luxembourg	
Finland	
Unknown	
Totals	

FINANCIAL STATEMENTS

STATEMENT I

To appropriation, 1919-1920.....		\$125,000.00
Wages, domestic.....	\$1,050.00	
Residence expense.....	4,163.98	
	<u>\$5,213.98</u>	
<i>Supervisor's Office—</i>		
Salaries.....	\$5,100.06	
Office expense.....	784.68	
Automobile expense.....	539.62	
	<u>6,424.36</u>	
<i>Heat, Light, and Power—</i>		
Wages.....	\$4,765.11	
Fuel.....	12,190.89	
Supplies.....	1,687.59	
Lighting supplies.....	294.88	
Electric current.....	2,399.72	
Repairs.....	775.97	
	<u>22,113.66</u>	
<i>General—</i>		
Patients' clothing.....	\$4,862.59	
Tobacco.....	2,488.43	
Transportation of patients.....	3,433.82	
Laundry.....	1,269.08	
Watchman.....	1,852.50	
Miscellaneous.....	1,389.71	
	<u>15,296.13</u>	
<i>Hospital—</i>		
Wages, attendants.....	\$22,167.52	
Drugs.....	1,657.65	
Bedding.....	2,020.84	
Fumigants.....	572.26	
Miscellaneous.....	1,893.15	
	<u>28,311.42</u>	
<i>Commissary—</i>		
Wages, cook and baker.....	\$5,047.44	
Provisions.....	6,557.19	
Utensils.....	683.51	
Fuel.....	1,285.87	
	<u>13,574.01</u>	
<i>Farm and Garden—</i>		
Wages.....	\$6,209.90	
Seeds.....	1,461.31	
Feed.....	602.74	
Tools and implements.....	551.86	
Repairs and equipment.....	1,045.59	
Miscellaneous.....	2,068.94	
	<u>11,940.34</u>	
<i>Dairy—</i>		
Wages.....	\$1,722.50	
Feed.....	5,596.48	
Repairs and equipment.....	112.91	
Miscellaneous.....	145.75	
	<u>7,577.64</u>	
Total expenses.....		\$110,451.54
<i>Less Produce Furnished—</i>		
Farm and garden.....	\$18,120.10	
Dairy.....	12,423.98	
	<u>24,614.87</u>	
Total disbursements.....		\$85,836.67

STATEMENT II

APPROPRIATION FOR RELIEF OF DISCHARGED PATIENTS

<i>Receipts</i>		
To appropriation.....		\$300.00
<i>Disbursements</i>		
By cash paid to patients on discharge.....	\$165.00	
By unexpended balance reverting.....	135.00	
		<u>\$300.00</u>

STATEMENT III

APPROPRIATION FOR CHAPLAINS

<i>Receipts</i>		
To appropriation.....		\$720.00
<i>Disbursements</i>		
To service of chaplains.....	\$680.00	
By unexpended balance reverting.....	40.00	
		<u>\$720.00</u>

STATEMENT IV

AMUSEMENT

<i>Receipts</i>		
Appropriation for amusement, 1919-1920.....		\$600.00
<i>Disbursements</i>		
Emporium of Music.....	\$2.65	
N. H. M. D.	15.00	
F. W. Woolworth.....	11.30	
R. C. Matson.....	5.50	
A. B. Manheim.....	44.70	
Menardi-Judd Co.	4.90	
Taking patients to circus.....	24.80	
Hurst Bros.	10.31	
Hurst Bros.	55.00	
Hurst Bros.	44.00	
Hurst Bros.	44.00	
Hurst Bros.	55.00	
Hurst Bros.	44.00	
By cash to Christmas tree ornaments and gifts to patients.....	238.84	
		<u>\$600.00</u>

STATEMENT V

APPROPRIATION FOR CONSTRUCTION AND EQUIPMENT, 1919-1920

<i>Receipts</i>		
To appropriation.....		\$6,000.00
<i>Disbursements</i>		
Reno Electrical Works.....	\$558.60	
Baker Hamilton Pacific Co.....	209.33	
Gray, Reid, Wright Co.....	839.98	
Palace Dry Goods House.....	351.75	
Reno Mercantile Co.....	115.82	
Nevada Engineer and Supply Co.....	16.90	
Samoville & Flagg.....	601.85	
McIntosh Motor Sales Co.....	41.20	
Commercial Hardware Co.....	40.30	
Nevada Hardware and Implement Co.....	265.47	
Reno Metal Works.....	3.00	
Donnell & Steinmets.....	498.95	
J. R. Bradley.....	488.81	
John G. Ills & Co.....	47.80	
C. B. Elderkin.....	300.00	
Calavada Auto Supply Co.....	738.35	
Underwood Typewriter Co.....	83.08	
Mott Stationery Co.....	12.80	
Edwards Hardware Co.....	3.50	
Nevada State Hospital.....	24.80	
Bouret, Kirkwood & Co.....	600.00	
Nevada Machinery and Electric Co.....	12.90	
Steinheimer Bros.....	29.23	
Commercial Hardware Co.....	73.84	
Overcharge from repairs appropriation.....	41.89	
		<u>\$6,000.00</u>

To appropriation.....	Receipts	
	Disbursements	
Leo & Febiger.....		\$17.25
N. H. M. D.....		9.00
Nevada Printing Co.....		5.25
Carson City Daily Appeal.....		4.50
The Emporium.....		11.00
Clement R. Troth.....		8.00
Carson City Appeal.....		6.00
R. L. Polk.....		5.00
Carson City Daily Appeal.....		6.00
A. Carlisle & Co.....		92.25
American Medical Association.....		5.00
Mariner Music Store.....		4.00
Repairing pool tables.....		26.75
		\$200.00

STATEMENT VII

STOCK SLAUGHTERED

Veal	1,540 pounds	\$294.23
Cows	5,365 pounds	883.64
Hogs	4,967 pounds	972.89
		\$2,150.76

STATEMENT VIII

RECAPITULATION OF APPROPRIATIONS AND EXPENDITURES, 1919-1920

	Appropriation	Expended	Balance	Deficit
For support.....	\$125,000.00	\$132,766.97		\$7,766.77
Equipment	6,000.00	6,000.00		
Repairs and improvements.....	4,500.00	680.00		
Chaplains	720.00	680.00	40.00	
Amusement	600.00	600.00		
Library	200.00	200.00		
Relief of discharged patients.....	300.00	165.00	135.00	
Totals	\$137,320.00	\$144,911.97	\$175.00	\$7,766.77
Average cost per month.....				\$5,534.57
Cost per day.....				178.53
Cost per patient per day.....				.78

VEGETABLES RAISED DURING TERM OF 1919-1920

220 tons field corn ensilage	15 tons tomatoes
150 tons potatoes	2 tons green peppers
20 tons pumpkin and squash	20 tons watermelons and muskmelons
80 tons stock beets	2,280 bunches celery
18 tons carrots	160 pounds rhubarb
20 tons table beets	810 pounds lettuce
12 tons turnips	660 bunches radishes
12 tons parsnips	1,795 pounds peas
127 tons onions	2,425 pounds string beans
2 tons rutabagas	1,158 pounds cucumbers
4 tons cabbage	

LIVE STOCK ON HAND

9 work horses	86 cattle
119 hogs	1 bull
1 boar	

FARM TOOLS ON HAND

12 shovels	2 crosscut saws
12 garden hoes	2 hand saws
6 manure forks	2 claw hammers
12 hay forks	2 crowbars
6 picks	2 carpenter's squares
6 mattocks	4 wheelbarrows
4 axes	1 handcart

FARM IMPLEMENTS ON HAND

1 oil wagon	1 potato digger
8 farm wagons	1 potato planter
1 spring wagon	1 seed drill
1 dump cart	1 corn cutter (farm)
1 walking plow	1 milking machine
1 riding plow	1 cultivator
2 mowing machines	1 garden seed drill
2 hay rakes	3 garden cultivators
1 corn planter	4 garden rakes

EXHIBITS OF FORMS

REQUEST TO DISTRICT JUDGES

NEVADA HOSPITAL FOR MENTAL DISEASES
RENO, NEVADA

To the Honorable.....
Judge of the.....Judicial District,
....., Nevada.

DEAR SIR: We beg to call your attention to several matters in connection with the commitment of patients to the Nevada State Hospital for Mental Diseases, enabling us to more thoroughly obtain histories and data in regard to them.

The motive for writing this statement is to enlist your best endeavor to assist the State in retarding the rapid encroach of mental disease upon our citizenship.

While it is true that the patient's hospital record commences with his admission, yet the introduction to such a record must necessarily take as a basis the evidence contained in the statements which are transmitted by a Clerk of the Court to the institution. Much depends, therefore, upon the accuracy of the statement alleging insanity.

The medical men who are called upon in these cases should insist that the questions in such statements be fully answered.

Much more depends, however, upon the willingness of the physicians who compose the commission to impart extensively and precisely the results of their observation and effort covering the case while under their care, treatment, or professional investigation.

It is our duty to attempt to impress upon you the urgent necessity of furnishing the Hospital, through such record, not only extended information relative to the onset, course, and manifestations of the case, but, also, as completely as possible, the important parts of the patient's family history.

Insist that all witnesses in the inquests relate fully their knowledge of the case for judicial entry.

You are unquestionably cognizant of the fact that in many of the cases admitted here, it is almost an impossibility to obtain from them any reliable statement of the onset of their malady. These patients are not in a condition mentally to communicate facts, and, therefore, we must rely, practically, upon the record of commitment as our full source of information.

We appeal to you, to the physicians upon whom you call, to make these records so complete that we can proceed with rational treatment of the patient.

The institution makes every endeavor to supply the data lacking to make the record conform to the schedule of mental and physical examinations by personal interviews with physicians, relatives or friends, or by correspondence where this is convenient.

We enclose a form of questionnaire which may be valuable as a suggestion to the physicians called in these cases. These are points of vital importance to us and which are more readily obtained at the patient's home or place of residence. If you would call the attention of the examiners to this form, we would be greatly obliged.

We realize the value of your assistance to the institution and ourselves in the past, and assure you of our appreciation.

Very truly yours,

....., Superintendent.

RENO, NEVADA

....., Sheriff of.....County,
....., Nevada.

DEAR SIR: I receive telegrams from the various counties advising me of the commitment of a patient to the Nevada Hospital for Mental Diseases.

It has occurred to me that, after the receipt of this letter, it will not be necessary for me to wire you when you send such a telegram, for the reason that I shall, immediately upon its receipt, dispatch an attendant to convey the patient to Reno, and, therefore, you may expect the attendant to reach you without delay.

I am making this suggestion merely to save the State the expense of answering the telegrams.

Very truly yours,

....., Superintendent.

TRANSCRIPT OF EVIDENCE ON COMMITMENT

NEVADA HOSPITAL FOR MENTAL DISEASES

RENO, NEVADA

To the Honorable.....,

Judge of the.....Judicial District,

....., Nevada.

DEAR SIR: Would it be too much to request you to forward to me the transcript of the testimony taken during the hearings of inquests into a patient's sanity?

Such a transcript would be of great and immediate assistance to the hospital authorities, as containing a history of the case, and it would be very helpful for purposes of diagnosis and subsequent treatment. We could secure, by examination of that transcript, much information which can only be obtained at the expense of a great delay and from an examination of the patient himself.

Would you also request the Clerk of the Court to forward such a transcript if the hearing is held before him? I am making this suggestion in the interest of public service.

Very truly yours,

....., Superintendent.

HOSPITAL BUDGET

RENO, NEVADA, January 4, 1921.

HON. EMMET D. BOYLE, *Governor of the State of Nevada, Carson City, Nevada.*

DEAR GOVERNOR: In response to your letter of instruction, dated November 15, 1920, and in compliance with "An Act providing for a state budget," approved March 10, 1919, I have the honor to submit, briefly, as you direct, the expenditures of the Nevada State Hospital for Mental Diseases, for the biennium ending December 31, 1920, and a brief summary of the essential needs of the Hospital for the years 1921 and 1922.

The appropriations by the last Legislature were:

Support and maintenance	\$125,000.00
Repairs and improvements.....	4,500.00
Equipment	6,000.00
Relief of discharged patients.....	300.00
Amusement	600.00
Library	200.00
Chaplains	720.00

The item of \$2,085.50, "Pay Patients' Fund," was also sent to the State Treasurer.

The cost of transporting patients to the Hospital (\$3,632.18) was a charge against the maintenance fund.

A deficiency of \$7,766.77 has been created during the months of November and December.

The total cost of betterment, repairs, and maintenance for the two years was \$145,558.73.

I believe I need not explain to you, who are so well acquainted with the price situation for the last two years, that it has been only by the strictest economy that this institution has been creditably run for this amount during the last two strenuous years.

I have the following recommendations to make for the budget of the Hospital for the ensuing two years, and urge the necessity of each item in the making of a modern and efficient hospital for the care and treatment of the insane, out of the present obsolete and decrepit plant.

For maintenance, including transportation of patients.....	\$144,000.00
Relief of discharged patients.....	300.00
Amusement	600.00
Library	200.00
Chaplains	720.00
Repairs of stone house for occupancy by employees.....	2,000.00
Roof, and installing steam-heating plant, etc., for Superintendent's residence	1,500.00
Cow sheds	1,000.00
New well and repair of storage tank.....	1,200.00
Forge and tools for machine shop.....	600.00

Alterations in electric wiring, switchboard, etc.....	1,500.00
A fund placed in the hands of the board for purchase of 50 acres of adjacent land and acquisition of power plant, approximately	30,000.00
Purchase of 12 registered dairy cows.....	1,500.00
Furnishings and equipment of new treatment building in course of construction	20,000.00
Two buildings to accommodate 40 patients each (estimate of State Architect)	(each) 40,000.00
Kitchen and commissary, as per design of State Architect..	20,000.00

All of which is respectfully submitted as the requirements in the interest of efficiency and economy.

R. H. RICHARDSON,
Superintendent.



PUBLIC SERVICE DIVISION
UNIVERSITY OF NEVADA

REPORT

OF THE

Department of Food and Drugs Control and Weights and Measures

FOR THE

PERIOD ENDING DECEMBER 31, 1920

PUBLISHED BY THE UNIVERSITY OF NEVADA
RENO, NEVADA



CARSON CITY, NEVADA

STATE PRINTING OFFICE—JOE FARNSWORTH, SUPERINTENDENT

1921



REPORT OF DEPARTMENT OF FOOD AND DRUGS

The work of the department during the past two years has proceeded along the same general lines of activities as in preceding years, embracing the inspection and analysis of food and drug product found on our local market, the sanitary inspection of all places in the State where such products are manufactured, stored, sold or offered for sale, which includes the bakeries, meat markets, grocery stores, restaurants, milk depots, dairies, etc. To the department have been submitted a large number of water samples, with the request that they be examined to determine their fitness for domestic, irrigation, or application in certain industrial developments. In addition we have been called upon to examine numerous samples of miscellaneous materials submitted by residents of the State, and investigation and report upon certain special problems which fall within the province of this department.

In the field work particular attention has been given to sanitary inspection during the past year, and while good results have been accomplished much remains to be done in order to bring the general standard of some business lines up to a point to meet the requirements of the department.

Considered as a whole the grocery stores and markets of the State are in excellent condition from a sanitary standpoint, as well as quality of products carried in stock. Recent inspection of bakeries showed that many of them are dirty, particularly the back-shop portion, and need cleaning up. A general summary of restaurant conditions could be stated as "fair." We find that the large hotels and eating houses are, for the most part, in excellent condition in every respect. The kitchens are clean and utmost care is exercised in the preparation and handling of foods for the table. It is some of the smaller places, conducted under conditions far from sanitary, that bring down the general average and it is such places that will receive our attention as soon as it is possible for us to resume our field work.

When we have found unsanitary conditions and methods existing in the handling of food products intended for human consumption, the proprietor or manager of the place has been served with a notice giving him a reasonable length of time in which to clean up and place his shop, factory or store in such a condition as would meet the requirements of this department. Follow-up visits have been made whenever it was possible to do so and without exception these visits have revealed the fact that compliance had been made with our suggestions and orders.

Practically each town in the State has been visited at least twice each year and special trips have been made to larger towns and distributing centers. On visiting new cities our practice has been to first obtain samples of milk offered in retail direct from the delivery wagons as they are found on their regular delivery routes, preparing the samples, and shipping them at once to the laboratory for analysis. The next point to receive our attention is the inspection of grocery stores and meat markets, going carefully over the stock on hand and taking such samples for detailed examination as deemed necessary, at the same time scoring such places, on forms prepared for the purpose, showing their sanitary rating. Next the restaurants and eating houses are visited, scored and suggestions made, if necessary, for

buildings, equipment and methods employed in milk production and handling are scored on the standard score-card. The field work of the Department of Weights and Measures is carried out in conjunction with food inspection. Details of this line of activities will be found in another part of this report, under the heading Weights and Measures.

The department has cooperated with other State Departments whenever called upon to do so. Nutritional surveys have been made of the University dining-hall and State Penitentiary. Specimens of stomach contents of domestic animals have been examined for the State Veterinary Control Service for suspected poisons. Numerous samples of materials bought on specifications have been passed upon for the State Highway Department, and a large number of samples of illicit liquors and drugs have been analyzed for the Nevada State Police, District Attorneys and County Sheriffs for the purpose of information in prosecuting violations of the State Prohibition and Narcotic Laws.

CHANGES IN THE DEPARTMENT

The activities of the department were seriously retarded during the early part of the period covered by this report by the resignation of Mr. H. B. Bulmer, who had been in charge of the work as Acting Commissioner during my absence while serving with the Food and Nutrition Section of the Army Sanitary Corps. The resignation of Mr. Bulmer left but one man, Mr. M. B. Kennedy, in the department, and little work outside the regular routine of the laboratory could be carried on. This situation was relieved in April, 1919, by the return of Mr. Wayne B. Adams, who had been on leave of absence from August 1, 1917, serving with the A. E. F. in France. I resumed my duties as Commissioner August 1, 1919, having been absent on leave from December 9, 1917. Mr. Kennedy resigned his position as Chemist April 1, 1920, to enter other fields, which again left the department short of help. Under the conditions prevailing at the time it was deemed advisable to defer filling the position, but to cover the field as adequately as possible with the personnel as it stands at present. During the months of June, July, and August Mr. C. M. Chatfield, a student in the University, was employed on special work in connection with certain data we were asked to gather for the Attorney-General of the State in the matter of the Truckee River pollution problem. Daily tests were made on samples of the river water, and frequent visits made to Floriston to note conditions and obtain samples for complete analysis.

BUTTER

A large number of samples of butter have been examined during the period covered by this report. None of the samples examined have been found to carry an excessive moisture content, but many of them gave a low score on the butter score-card. In scoring creamery butter the points taken into consideration in the order of their importance are flavor, body, color, salt and package. All of this work has been carried on in cooperation with Prof. V. E. Scott, State Dairy Leader, who has given us valuable assistance in scoring the samples collected. The low score given to many of the samples examined was undoubtedly due to bad conditions of the raw material, cream, at the time it is delivered to the factory, sufficient care not being exercised on the farm

extreme negligence is given to the proper production and storage of cream intended for butter-making, and it receives the least consideration of any product from the farm. It is not uncommon to find that the cream is put in dirty cans; that the fresh cream, warm as it comes from the separator, is dumped in with old sour cream that has accumulated during the past few days, the cans capped and allowed to stand in the milk-room over a long period before turning over to the creamery. As a consequence of such methods, the cream, when it reaches its destination, is in bad condition, at times putrid and absolutely unfit for the production of butter. By using a little care, which would require but a few minutes additional time each day, a good product could be delivered to the creamery and the producer receive a better price.

First, the cream container, usually a five or ten-gallon milcan, should be thoroughly cleaned. The cream held in storage should be kept in a cold place. The new cream, as it comes from the separator or from pans, should be cooled to the same temperature as the cream in the storage receptacle before the two are mixed, and more frequent deliveries made to the central creameries, especially during summer months, when it should be delivered at least three times a week. Prof. Scott has submitted to the department a large number of scores on market cream for butter-making, samples being taken from various parts of the State. These scores show the poor condition of the product delivered at the creameries, and the decided lack of care in handling this important food product. It is hoped that during the next period it will be possible for representatives from this department to visit the producer and explain in detail proper methods for producing and handling the cream.

Statistics compiled by the U. S. Bureau of Markets for the year 1919, as published in Flour and Feed Magazine, credits Nevada with the production of 1,725,494 pounds of creamery butter. It is interesting to note in this connection that, while we do not claim to be a dairy State, yet we lead nineteen other States of the Union in butter production.

The location of many of the irrigated districts of the State are ideal for extensive dairy activities and without question this important industry will receive rapid development within the next few years.

The following is a list of the larger creameries and butter manufacturing plants:

Mutual Creamery	Reno
Crescent Creamery	Reno
Western Meat Company	Reno
Chism Ice Cream Company	Reno
Riverside Milk Company	Reno
Minden Butter Manufacturing Company	Minden
Carson Creamery	Carson City
Douglas County Creamery	Gardnerville
Yerington Creamery	Yerington
Lamoille Creamery	Lamoille
Mason Products Company	Elko
Churchill County Creamery	Fallon
Cliff Brothers	Franktown
H. G. Biggler	Elko
Caesar Ramilli	Reno

During the past two years a number of substances sold as a substitute for butter have appeared on the market under various names, but all of them come under the general term of oleomargarine. These products are made by churning some kind of animal fat or vegetable oil, or both, with ripened milk, from which is derived the butter flavor. Some of the brands carry, in their carton or package, a small capsule of harmless coloring matters to be incorporated with the margarine to give it a butter color if the purchaser so desires. The vegetable oils chiefly used in the manufacture are cotton-seed, peanut, and cocoanut. The animal fats are oleo oil, neutral lard and butter-fat. Margarines found on the market are wholesome and the sale of this commodity is growing in this State. In order to deal in oleomargarine or imitation butter a special license is required from the United States Internal Revenue Department and at the present time fifty-three wholesale and retail dealers hold such licenses.

DAIRIES

Upon our visits to various sections of the State we have made it a particular point to look carefully into dairy conditions, especially those places producing market milk. Frequent samples are taken, submitted to the laboratory for chemical and bacteriological examination, the dairies visited and all conditions surrounding them that have in any way to do with the production of milk noted on the dairy score-card. Hundreds of samples of market milk have been examined. None have been found to contain a chemical preservative and but very few were below the minimum standard of 3.25 per cent butter-fat adopted by the State. To the local dairyman the point is emphasized as emphatically as possible that too much care cannot be given to the production of market milk to insure a safe supply. Milk, containing as it does, all the elements and life-giving vitamins absolutely necessary for the proper growth, development and upkeep of the body, may be termed the perfect food. It is the only one food that will indefinitely sustain life. Milk contains protein, muscle-building material, fat and carbohydrates for the production of body heat, mineral nutrients, which supplant the mineral deficiencies of cereals, meats and other articles that go to make our daily meals, and all the vitamins identified. Milk contains an abundance of calcium or lime salts, an essential inorganic constituent of our daily ration to neutralize the body fluids and give strength and material for bone building. Carefully conducted experiments show that 99.5 per cent of the nutriment of milk are assimilated by the system. Milk, even at fifteen cents per quart, is a cheap food and that amount of money spent for milk will return a greater amount in food value than the same amount spent for any food product at present prevailing prices. One quart of milk of average composition will furnish about 675 calories, the unit used in measuring the energy-producing value of a food, and is equivalent to 11 ounces of sirloin steak, 12 ounces of round steak, 8½ eggs, or 10.7 ounces of fowl.

To meet the state requirements milk must contain at least 3.25 per cent milk or butter-fat, be free from any adulteration, and produced under sanitary conditions. To meet these requirements, particularly the last named, it is incumbent upon the dairyman to install special equipment and keep the same in good condition at all times.

A dairy producing milk for family trade should score at least seventy points on the dairy score-card, and by exercising a reasonable amount of care and judgment this standard, or even a much higher score, can be obtained.

A number of central milk plants have been developed during the past two years in the larger towns of the State. Under this centralized system the raw milk is delivered to the plant by the producer or gathered by automobile trucks by the central milk company. The milk is subjected to pasteurization, clarified and bottled. The equipment at these central plants is kept in good sanitary condition, all returned bottles are thoroughly washed and protected from contamination by dust, dirt or flies. The state pasteurization law requires that self-registering and recording thermometers be attached to the pasteurizers and the records kept for the information of this department whenever they are called for. We find that this requirement is generally complied with. Market milk from these central plants is a uniform product and seems to be generally satisfactory with the trade.

The term "Pasteurization," as applied to milk, means the process of heating to 145° F. and holding at that temperature for 20 to 30 minutes, after which it is rapidly cooled and bottled. The value of pasteurization is of great importance when market milk is considered, for the process, when properly carried out, affords protection from pathogenic organisms and will destroy the bacteria that causes typhoid fever, tuberculosis, diphtheria, etc., should any of these disease-producing organisms be present in the raw product. Pasteurized milk, however, is not the best for infant-feeding, as the process destroys the antiscorbutic vitamine, or scurvy-preventing vitamine, and when pasteurized milk is fed to infants the use of orange juice or some vegetable extract is necessary to avoid the possibilities of scurvy. During the period covered by this report this department has received no information of a contagious disease from any town or city in the State that could be in any way attributed to the milk supply—a condition greatly improved over previous years.

WHAT ARE VITAMINES?

Since the importance of these compounds in food have come into prominence this is a question asked repeatedly, and as it is a matter of popular interest to the people of the State we believe a brief statement regarding vitamins can well form a part of this report. The following is an extract from a recent issue of the "Weekly News Letter," published by the United States Department of Agriculture, and gives in a few paragraphs the importance of these life-giving principals, as well as the particular articles of food in which they are found.

Investigations by scientists at universities, agricultural experiment stations, and institutions for medical research have revealed much information regarding the function of vitamins in body maintenance and building, and the parts of the various foods in which they are to be found.

That vitamins are compounds absolutely essential in the food, in order to maintain the weight of the body and produce growth, has been definitely proved. The lack of vitamins causes deficiency diseases, so named because they are due to lack of something in the diet. Vitamins are present and are needed in such small quantities in the food that chemists have not yet been able to isolate them from the many other compounds which are in foods. For this reason, we know very little of the actual character of vitamins.

According to a statement by Dr. Carl O. Johns, formerly in charge of nutrition work in the Bureau of Chemistry, United States Department of Agriculture, vitamins have been classified into three different types, depending upon the functions which they have in promoting well-being and growth.

The first type is known as water-soluble vitamins, and these are necessary in order to obtain growth from food. Lack of these causes beri-beri, which manifests itself by disease of the nervous system and by other symptoms. These vitamins are found in seeds, in green plants, in certain bulbs and fleshy roots and fruits, and in milk and eggs, as well as in certain organs in the animal body. The seeds referred to include beans, nuts and the various cereal grains. When cereals are very highly milled in order to obtain a very fine white flour, a large part of the vitamins may be removed. Vitamins are also lost when rice is polished in order to remove the outer layers which contain most of the vitamins. It is for this reason that a diet consisting mainly of polished rice may cause beri-beri, while unpolished rice does not cause this disease.

The second type is known as fat-soluble vitamins, and these are found in butter, eggs, milk and in certain animal organs, such as the heart, kidneys and liver, and to some extent in other fats, as well as in green vegetables. They also exist in smaller quantities in certain seeds. When fat-soluble vitamins are absent from the diet, animals and man are subject to a disease of the eyes, which appears to be related to xerophthalmia and which, if prolonged, may produce blindness.

The third type is known as antiscorbutic vitamins—that is, those which prevent scurvy, which manifests itself by disease of the bones as well as in other ways. These vitamins are found in oranges, grapefruit, lemons, and other citrus fruits, and in green vegetables, such as tomatoes, spinach and lettuce, and in eggs and raw milk. The drying of vegetables frequently destroys the activity of the antiscorbutic vitamins. The best source of vitamins is in the leafy parts of vegetables, and this is one of the reasons why spinach, lettuce and cabbage are valuable foods.

CANNED GOODS

General inspections of all canned goods have been made in every city visited. Numerous official samples have been taken for laboratory examination and analysis, and many samples have been submitted to the laboratory for judgment.

We have found the shelf stock in the retail stores of the State to be in very good condition. Dealers have been repeatedly cautioned not to allow cans that showed any degree of "swell" or bulging to be delivered to a customer, and whenever such cans are noticed to remove them from his stock at once. It is a fact recognized by the department that contents of all tins having a bulging appearance are not necessarily unfit for food, as the bulging may result from various causes. It is quite impossible for the dealer to draw the line as to what is safe unless he has had wide experience in the canning industry, and as a general principle we advocate the destruction of all cans that have the appearance of a "swell." A can regarding which there may be a question, if allowed to go out in retail trade, might result in serious consequences, should the material be, in fact, decomposed and carry some toxic principal.

The bulging end, when noticed in nonacid products, such as corn and peas, may be assumed to be due to decomposition, while on the other hand, with acid fruits, spoilage is rare unless the can be leaky, and the bulging in the case of such products may be attributed to the action of the fruit acid on the metal of the container, producing hydrogen gas. Under no conditions should food products high in protein, such as canned meats or fish, be used as food when the can shows the least sign of bulging, as in all probability the contents of

the can is undergoing putrefactive decomposition, and if such is the case deathly poisons will undoubtedly be produced.

The conditions known as "springers" is produced by overfilling the can at the time of packing or by unsatisfactory storage. We frequently find cans with bulged ends, but by gentle pressure the can resumes normal shape. Such cans are not true "swells," and the contents are entirely safe as an article of food. During the hot summer months, or by storage in a warm place, "springers" may develop in a shipment of canned goods within a short time. With such cans, when the goods are removed to a cool place or the atmospheric conditions change and the temperature drops, they again become normal.

About a year ago the country became alarmed through newspaper accounts of deaths resulting from eating poisoned ripe olives, and for a time the sale of this commodity greatly dropped off. Ripe olives of any brand, or put up in whatever kind of container, were regarded with suspicion. Many inquiries were made at the laboratory relative to the matter and requests made for information along certain lines. Through investigations conducted by the Bureau of Chemistry, United States Department of Agriculture, it was possible to locate not only the factory, but the particular batch, by means of what may be designated the batch number, from which the cases of poisoning originated. All of the shipments of canned olives from these batches were traced by the brand and identifying number from the factory through the jobbing-houses to the retail dealer, and when located were destroyed. As soon as these facts were established we received letters from the bureau giving the manufacturer's name and address and also the identifying batch number, which appeared on the principal label of the container. A thorough survey was made of all the markets of the State and while olives were found that were packed by the firms mentioned none of the specific batches that had caused trouble in different sections of the United States were located. No cases of botulinus poisoning were reported. Factory inspections and a study of the methods employed in preparing the product for the market showed that the cause of the trouble was due to defects in the methods of pickling, packing and processing the olives. In all of the poison cases investigated it was found that the olives were put up in glass containers. In most establishments the product when so packed was sterilized at about the temperature of boiling water, and this temperature is too low to insure the destruction, in every instance, of the bacillus and toxin which it produces. The trouble, the specialists say, is not inherent in the glass container if sound olives be used and the packages are properly sealed and sterilized. Unfortunately some of the packers, in their anxiety not to break the glass container, do not always process them at a sufficiently high temperature to destroy some of the dangerous organisms. The poison would develop just the same in tin containers if they were not processed at a high degree of temperature, but as there is no danger of breakage in tin, the degree of heat to which the package is subjected is sufficient to completely eliminate the dangerous bacteria and destroy the poison which they produce.

As a result of these investigations factory processes have been revolutionized and at the present time there is no danger in so far

there any likelihood of recurrence of an outbreak similar to that experienced recently.

EGGS

Section IV of the Food and Drug Law reads: "Food shall be deemed adulterated within the meaning of this act, if it consists in part or in whole of a filthy, decomposed or putrid animal or vegetable substance."

Bad eggs are held to be an article of food consisting in whole or in part of a decomposed substance, and the sale of the same is prohibited. In certain sections of the State we found that quantities of bad eggs were being offered for sale, and wherever these conditions existed inspections were made and eggs in such a state of decomposition as to render them unfit for food were destroyed. Under no condition can storage eggs be placed on the market as fresh eggs. We advise the candling of all eggs as they are placed in storage and again when taken out to insure a sound product being placed upon the market. The practice of preserving eggs is becoming popular and numerous inquiries are made as to the proper procedure. Eggs are bought up during the summer months when they are cheap, and by proper care being exercised in the method of preserving they may be kept over a period of months. As to the most satisfactory method of preserving, the following is taken from a publication issued by the United States Department of Agriculture relative to the preserving of eggs:

In the first place, the eggs must be fresh, preferably not more than two or three days old. This is the reason why it is much more satisfactory to put away eggs produced in one's own chicken yard.

Unfertilized eggs are the best if they can be obtained.

The shells must be clean. Washing an egg with a solid shell lessens its keeping quality. The protective gelatinous covering over the shell is removed by water, and when this is gone the egg spoils rapidly. The shells also must be free from even the tiniest crack. One cracked egg will spoil a large number of sound eggs when packed in water-glass.

Earthenware crocks are good containers. The crocks must be clean and sound. Scald them and let them cool completely before use. A crock holding six gallons will accommodate eighteen dozen eggs and about twenty-two pints of solution. Too large crocks are not desirable, since they increase the liability of breaking some of the eggs and spoiling the entire batch.

It must be remembered that the eggs on the bottom crack first and that those in the bottom of the crocks are the last to be removed for use. Eggs can be put up in smaller crocks and the eggs put in the crock first should be used first in the household.

"Water-glass" is known to the chemist as sodium silicate. It can be purchased by the quart from druggists or poultry supply men. It is a pale yellow, odorless, syrupy liquid. It is diluted in the proportion of one part of silicate to nine parts of distilled water, rain-water or other water. In any case, the water should be boiled and then allowed to cool. Half fill the vessel with this solution and place the eggs in it, being careful not to crack them. The eggs can be added a few at a time until the container is filled. Be sure to keep about two inches of water-glass above the eggs. Cover the crock and place it in the coolest place available, from which the crock will not have to be removed. Inspect the crock from time to time and replace any water that has evaporated with cool, boiled water. When the eggs are to be used, remove them as desired, rinse in clean cold water and use immediately.

Eggs preserved in water-glass can be used for soft boiling or poaching up to November. Before boiling such eggs, prick a tiny hole in the large end of

the shell with a needle to keep them from cracking. They are satisfactory for frying until about December. From that time until the end of the usual storage period—that is, until March—they can be used for omelettes, scrambled eggs, custards, cakes and general cookery. As the eggs age, the white becomes thinner and is harder to beat. The yolk membrane becomes more delicate and it is correspondingly difficult to separate the whites from the yolk. Sometimes the white of the egg is tinged pink after very long keeping in water-glass. This is due, probably, to a little iron which is in the sodium silicate, but which apparently does not injure the egg for food purposes.

SACCHARIN IN FOODS

The use of saccharin as an artificial sweetening agent is prohibited in the manufacture of foods offered for sale in this State. The high price of sugar, which prevailed the first of the year, led certain manufacturers to search for a substitute. A thorough canvass was made of soft drinks, soda fountain syrups, and other products in which saccharin might be substituted for sugar. Several samples showed that saccharin was being used, and cases were instituted against the offending party. A large shipment of saccharin to one of the manufacturing concerns of the State was found in its original unbroken package. This shipment was seized and all of the facts in the case reported to the federal food and drug officials for action. In due time the case was brought before the Federal Court, and by order of the Federal Judge the saccharin was destroyed. In many instances it was brought to our attention that saccharin manufacturers had sent out circulars to soft-drink manufacturing establishments, stating in their literature that the use of saccharin was permissible, and the local manufacturer was under the impression that the material met with the approval of this department. This erroneous impression has been obviated and at the present time it is safe to say that no saccharin is being used in the preparation of food products manufactured or sold in this State.

Saccharin is derived from coal-tar, it is about five hundred times as sweet as sugar, and it is absolutely void of food value. A few years ago the question of the physiological effect if saccharin be used as a sweetening agent in food products was placed before the Remsen Referee Board. After exhaustive study the board found that saccharin in amounts exceeding three-tenths of a gram per day, which amount the consumer could easily ingest should the use of saccharin be permitted, produces marked physiological disturbances. From the fact that saccharin has no food value it is considered an adulterant, as well as an added poisonous ingredient, when used in foods, in that it reduces and lowers the food value of the product to which it is added. During the past three months, of the many samples examined in the laboratory, none were found to carry this artificial sweetening agent.

CANDY

A large number of candy samples have been examined with particular reference to the character of the coloring matter used. The use of eight coal-tar dyes is permissible in the artificial coloring of candy or other food products. These colors must be of the certified type as provided by certain regulations prescribed for the enforcement

make preserves and jelly is due to other causes rather than to the kind of sugar used in the process. Insufficient sterilization of containers will cause a fermentation to take place in the canned product. This spoilage cannot be attributed to the kind of sugar used, but is, in fact, due to carelessness on the part of the operator. In jelly-making the principals that cause fruit juice to jell, as it is termed, are what is known as pectin bodies. In many fruits these so-called pectin bodies are lacking. In fruits generally there is an apparent decrease of the pectin substances as the fruit ripens, and any fruit juice that will produce a good firm jelly when used in an unripe stage will fail to jell satisfactorily when the fruit has reached maturity, irrespective of the character of sugar used or the care taken in the manufacturing process.

In the manufacture of candy, jams, jellies and preserves glucose is often used in lieu of sugar. Such products, to meet the requirements of the state law, should be labeled, setting forth the fact that glucose is one of the constituents. Glucose or corn syrup, as the latter name implies, is made from corn. It is a wholesome product, about two-thirds as sweet as sugar, and has approximately the same food value as sugar syrup of the same consistency.

ELKO COUNTY FAIR

Officials of the Elko County Fair, which was held in September, 1920, requested that we supervise and make the necessary tests for a milk contest to further the cause of better milk in that community. A dozen or more contestants entered their cows with considerable enthusiasm and interest. A period of three days was decided upon for the contest. Each contestant was requested to thoroughly "strip" his animal before the first milking test. The customary two milkings were made daily and the milk from each entrant at each milking was carefully weighed, sampled and recorded. Through the courtesy of the Mason Products Company of Elko, we were able to make our Babcock butter-fat tests on the ground, thus avoiding the delay of shipping the samples into Reno for testing. At the end of the three-day period the pounds of butter-fat produced by each cow during this time was computed, the prize being awarded to the cow producing the greatest number of pounds of fat for the stated time. Contests of this nature tend to create an interest in better grades of dairy stock and we are always glad to assist in any way possible.

During the past twelve months we have been called upon to make tests on entire dairy herds, to enable the dairyman to "weed out" animals that do not pay for their keep. When work of this nature is under way a representative of the department is present at milking time to weigh the milk and take the samples.

COOPERATION WITH FEDERAL FOOD AND DRUG OFFICIALS

The State Commissioner of Foods and Drugs is authorized by the Secretary of the United States Department of Agriculture to collect samples of food and drug products that are shipped in interstate commerce. It very often happens that cases arising from shipments of adulterated or misbranded goods may be more expeditiously handled by the federal officials. In such instances, official samples are taken and, together with all the records necessary to constitute a case, are

federal officials, of particular lines of goods in which they are interested, of suspected, adulterated or misbranded products that have been shipped to Nevada from different sections of the country. Many samples have been submitted to the San Francisco office during the past year. By working in cooperation with the Federal Department we have received much valuable assistance and information pertaining directly to the work in Nevada.

At the present time there is a strong movement among the various state officials, the federal officials and manufacturing interest, working toward uniformity in food and drug legislation. The food and drug law of Nevada is modeled after the federal food and drugs law and is uniform, with but few minor instances, with the national law. Products that are labeled and are of a standard that will meet the federal requirements will pass in this State. A bill is pending before Congress, which, in substance, provides that whenever there is a conflict between the federal and the state food law, the federal law shall have precedence. There is also before Congress another bill of interest to the retail dealer, which provides for the elimination of what is known as the "slack package." This law provides that the package, of whatever nature it may be, shall be full, and thus do away with many misleading packages that are found on the market at this time. It is not uncommon to find certain commodities put up in pasteboard cartons, the container but two-thirds full of material. To be true the statements of net weight on the packages may be correct, but nevertheless the package is deceptive and is unfair to the manufacturer who puts out exactly the same amount of goods in a smaller package, full pack.

FEED INSPECTION

There were no large amounts of cottonseed meal shipped into the State this year as has been prevalent during the past few years. A few shipments, however, have come to our attention, and sampled for analysis. The question of feeding stuffs is covered in a general way by the state food and drugs law. Nevada ships in a large amount of concentrated foods during the year, and I believe a special feeding-stuffs law should be enacted by the State Legislature in order that a more suitable control may be had of such commodities. Nevada is, I believe, the only State in the union without such a law on its statute books.

ICE-CREAM

Approximately 80,000 gallons of ice-cream were produced in this State the past year, and quantities are shipped in from the neighboring States of California and Utah. Practically all of this product consumed in the southern part of the State comes from Los Angeles and Salt Lake City, while Ogden, Utah, finds a market in the eastern part of the State. A large number of samples have been analyzed and practically all have been found to comply with the State's standard.

NUTRITIONAL SURVEYS

Nutritional surveys have been made, upon request, of the University dining-hall and the State Penitentiary. The object of the surveys was to determine, on a person-per-day basis, the amount of protein,

fat and carbohydrates, the essentials of a food, actually consumed during the seven-day period the institutions were under study; also, from invoices and price sheets, the actual daily cost of feeding, the amount of waste and other important points connected with the commissary end of a large institution. The data is obtained by making an accurate check of the kinds and amount of foods used during the period, and from the chemical analysis of the foods, computing the total amount of protein, fat and carbohydrates served. From these figures is deducted the amount wasted during the period by weighing the edible waste, sampling the same and submitting to analysis. The inedible waste is also taken into consideration to determine the total waste for the period. Complete reports covering every detail of the work have been submitted.

Following is a summary of the survey conducted at the University dining-hall:

	Total			Food per person per day			
	Protein—Pounds	Fat—Pounds	Carbo-hydrates—Pounds	Protein—Grams	Fat—Grams	Carbo-hydrates—Grams	Fuel value—Calories
Supplied	257.86	328.04	811.32	139.32	177.1	488.1	3,960.4
Wasted	35.90	37.84	57.80	11.1	20.2	30.5	352.3
Consumed	221.96	290.20	753.52	128.12	156.9	407.6	3,608.1

Average number of persons served per day.....120

Protein calories consumed divided by total calories consumed...35.50%

Fat calories consumed divided by total calories consumed.....43.46%

Carbohydrate calories consumed divided by total calories consumed

11.29%

Cost per 1,000 calories.....0.163 cents

Cost per 100 calories.....0.016 cents

Cost of food per person per day.....0.579 cents

Cost of waste per person per day.....0.0523 cents

Actual cost of food used during period.....\$486.46

Total waste per person per day.....0.92 pounds

Edible waste per person per day.....0.52 pounds

At the State Penitentiary a more complete investigation was made, and in addition to the food survey, included a report on sanitary conditions about the prison, general condition of all buildings, and a survey of the prison farm buildings and equipment. A detailed report has been submitted to Warden R. B. Henrichs and will be published as a part of his biennial report.

FLAVORING EXTRACTS

Shortly after the state prohibition law became effective the question was raised as to the legitimacy of the sale of extracts containing more than one-half of one per cent of alcohol by volume. In certain sections of the State the sale of such products was prohibited by the district attorneys, they holding that licensed pharmacists only could legally handle alcoholic extracts, and that a grocer making a sale was liable to prosecution for violation of the prohibition act. This question has recently been passed upon by the U. S. Internal Revenue Department, and the ruling prescribed in section 94 of Regulations 60 follows:

All preparations which are unfit for use as beverages or for intoxicating

beverage purposes, in the manufacture of which the use of intoxicating liquor is authorized, may be sold in good faith and used for any legitimate nonbeverage purpose without the necessity of obtaining permit under these regulations, except as hereinafter provided. Such preparations may not be sold for beverage purposes or under circumstances from which the seller may reasonably deduce an intention on the part of the purchaser to use for such purposes.

Alcoholic flavoring extracts are classed as preparations unfit for use as beverages and their sale, "in good faith," is permissible. The percentage of alcohol is not required to be stated on the label in the case of extracts sold for the preparation of foods only. To be entitled to the name "Extract," without any qualifying statement, they must comply with the standards adopted by this State.

MISCELLANEOUS

A series of experiments were undertaken at the time the Fallon crop of cantaloupes and watermelons were ready for harvest, on the keeping qualities of cantaloupes by laboratory treatment, and later placed in cold storage at a constant temperature, and the utilization of surplus watermelons as a source of edible syrup. Promising results were obtained in the experiments with cantaloupes and they will be continued next season.

By extracting the juice from watermelons and evaporating in open kettles, a table syrup of excellent quality is obtained. Briefly the method of procedure is to remove the pink flesh and seeds from the rind of sweet, fully ripe melons, crush the flesh with a potato-masher, or by running through a meat-chopper. Squeeze out the juice by placing the pulp in cloth-bags, and boil down the syrup in ordinary preserving kettles to proper consistency. In our laboratory tests we found that twelve quarts of juice produced one quart and four fluid ounces of syrup. By bottling hot in sterilized containers the syrup can be kept over a long period.

Following is a tabulated statement of the analytical work conducted in the laboratories for the period covered by this report:

Ice-cream	59
Vinegar	35
Lemon extract	9
Catsup	9
Preserves, jam, etc.....	6
Meat products	6
Cream	44
Soft drinks	73
Edible oils	3
Vanilla extract	8
Butter	11
Canned vegetables	8
Water	215
Liquors	195
Beer	131
Stock foods	22
Mineral and fertilizer material.....	65
Honey	10
Eggs	4
Bread	4
Cereals	8
Flour	18
Salt	4
Syrups	18

Oils and paints	4
Cheese	6
Milk	814
Crackers	13
Mother's milk	28
Stomach contents for poisons.....	6
Foods for poisonous material.....	14
Condensed milk	10
Drug preparations	51
Miscellaneous	23
Total	1,935

That the character of foodstuffs found on the local markets today is greatly improved over that of a few years ago must be apparent to any observing person. Adulteration, mislabeling and misbranding of every-day foods were common up to the time the federal food and drug law was adopted and the various States falling quickly in line with laws looking toward the correction of those evils within the borders of the State. Through the activity of the federal agents regulating interstate traffic in adulterated goods and activities on the part of the state departments in the enforcement of the state statutes, adulteration and misbranding of foods and drug products has been reduced to a minimum.

WATER LABORATORY

The usual amount of work in the investigation and examination of water supplies and analyses of water samples has come to the department during the period covered by this report. Requests for information and analyses come from all sections of the State and includes water intended for various uses, such as domestic, stock watering, irrigation and industrial application. A number of complete sanitary analyses have been made for the State Hygienic Laboratory, supplementing bacteriological examination made by that department of the Public Service Division.

Due to the water shortage in the State during the past season the source of public supply was hardly sufficient to meet requirements in some towns and it was necessary to develop additional water. Particularly was this true in Elko, where for a time the shortage was a serious matter with the city water company. Normally the town supply is obtained from mountain springs, distributed through a reservoir and pipe system, together with water-pumping directly into the water mains from wells located in the southeast section of that city and about two hundred feet from the north bank of the Humboldt River. This source of supply was entirely inadequate the past season, and to meet the demands upon the water system the company dug trenches along the banks of the river near their pumping wells, and through the water galleries, or trenches, sufficient water was developed to meet the emergency. At the request of the manager of the company, several trips were made to Elko to go over the situation with him and to obtain samples for analysis. The location of the wells and galleries are such that serious contamination is liable, and for that reason, in my report to the water company, I strongly advocated a new source of supply for the city, remote from any possible source of pollution. This matter is under consideration at the present time, steps are

being taken to provide for a better system, and undoubtedly a change will be made in the near future.

We have also investigated conditions surrounding wells on the dairy farms visited and many samples of well-water have been taken for sanitary examination and analyses. All is not pure water that sparkles. Many persons confuse clear water with clean, and think that because water is clear and sparkling it is necessarily pure. On the contrary, water that appears best to the eye may be polluted to a point where it is decidedly dangerous to health. It may be clear and yet contain the deathly germs of typhoid fever or other diseases. It may also contain considerable poison matter in solution. A polluted water supply is evidence of the existence of bad sanitary conditions which it is of the most importance to remedy. The most important consideration in connection with the water supply is to get clean water. The first logical step to accomplish this is to remove all sources of possible pollution. Among the worst of these is the open privy-vault, the leaching cesspool and barn-yard filth. A well in ordinary pervious soil located lower than and within one hundred feet of any of these is almost certain to be polluted, and in establishing a well this point should be given most careful consideration. The well should be located as high as possible with respect to buildings, stock-pens and chicken-yards, and as far away from channels of impure drainage and other sources of pollution as possible.

Sewage, garbage, manure or other waste should never be dumped into old abandoned wells; an old well used for this purpose is very likely to communicate directly with and pollute the water-bearing stratum from which the other wells in the vicinity draw their supply. Slops or other waste water should never be thrown out of the back door or window upon the ground. If the pigs and chickens must run at large they should at least be kept away from the well. In other words the immediate area surrounding the well should at all times be kept scrupulously clean in order to avoid any possible contamination.

We frequently receive samples of water in dirty containers, and others in such small quantities that complete analysis is impossible. We cannot undertake work on such samples for the reason that the analytical data on samples in dirty containers would be without meaning, and but very little information can be given on samples that are small. Water submitted to the laboratory for analysis should be taken in thoroughly clean receptacles, and when complete sanitary and mineral analysis is desired at least two quarts in amount. The samples should be taken in clean bottles carefully rinsed at least four times with the water before the sample is finally taken, the bottle plugged with a new clean cork-stopper and sealed. Bacteriological examinations cannot be undertaken unless the sample is sent to the laboratory in a sterilized container and packed in ice and sawdust. When such examinations are desired the better method of procedure is to call upon the laboratory for containers and directions for packing and shipping the sample.

As a rule the waters of this State are relatively high in mineral matter. For that reason it is impossible to set any hard and fixed classification of water for domestic use as a guide for accepting or

Very good—Total mineral matter not exceeding 100 parts per million, free from organic matter, clear, odorless, tasteless.

Good—100 to 500 parts per million total mineral matter.

Fair—Between 500 and 1,000 parts per million sodium or calcium carbonated, or both, possibly passing sodium sulphated waters.

Poor—1,000 to 5,000 parts per million total mineral matter. Rejecting sodium, sulphated and calcic waters.

Unfit—Above 5,000 parts per million any class.

According to mineral content the practice adopted in this laboratory is to classify waters as follows:

Lightly mineralized.....	0 to 100 parts per million
Moderately mineralized.....	100 to 500 parts per million
Highly mineralized.....	1,000 to 5,000 parts per million
Excessive	5,000 and above

WATER FOR IRRIGATION

Analysis of samples intended for irrigation, and to determine their adaptability for that purpose, includes determination to show the amount in parts per million of carbonates, bicarbonates, sulphates and chlorides, and, if present in appreciable amounts, magnesium salts. We also report what is termed alkali coefficient. This is purely an arbitrary quality, intending solely to facilitate the comparison of water to be used for irrigation. It may be defined as the depth in inches of water which, on evaporation, would yield sufficient alkali to render a four-feet depth of soil injurious to the most sensitive plants. Thus, if the alkali coefficient of a water is found to be seventeen, seventeen inches in depth of that water contains sufficient alkali to render it injurious to sensitive crops the soil on which it is applied. Whether injury would actually result from the application of such a water to any particular piece of land, however, depends on the method of irrigation, the crops grown, the character of the soil and the drainage conditions. It should be clearly understood that the alkali coefficient in no way takes account of such conditions. In reporting the alkali coefficient of water intended for irrigation the following classification is used:

Alkali coefficient greater than 18.....	Good
6 to 18	Fair
1.2 to 6.....	Poor
Less than 1.2.....	Bad

Continuing the work started sometime ago we have made complete mineral analyses of several of the hot springs of the State. We are gradually accumulating this data and hope to be able to publish a bulletin on the hot springs of Nevada in the near future.

DEPARTMENT OF WEIGHTS AND MEASURES

The work of this department is carried on in conjunction with the State Food and Drugs Department, and field inspection of the two departments is carried out jointly. Inspectors on trips over the State are provided with weights and measures testing equipment and attention is given to all weighing and measuring devices used by the local dealers. All counter scales are inspected and checked against standardized weights and if found correct, or within the established tolerance, they are sealed with the seal of the department, giving the date of inspection and name of the sealer. Any scales or measuring devices that cannot be made to weigh or measure correctly is condemned and its further use prohibited.

The inspection of gasoline measuring pumps has been state-wide. As a rule we have found the pumps in good condition and to check out within tolerance. During the year 1920, 40.74 per cent of the pumps tested were correct; 37.03 per cent were found to be delivering over measure, and 22.23 per cent short. The discrepancy in the pumps not correct was slight, in most cases within tolerance, and in all but six cases were adjusted, it being necessary to condemn that number, as they could not be adjusted to measure correctly.

The testing of wagon scales and stock scales, of which there are a large number in the State, presents a difficult problem and as a rule special trips are necessary when work of this nature is at hand. In order to get a satisfactory test on such weighing devices, it is necessary for the inspector to have on hand at least one thousand pounds of test weights. The test weights are made up of units of fifty pounds each, standardized on trial balances in the laboratory, and checked against weights that have been passed as correct by the United States Bureau of Standards. In order to facilitate work of this nature and to save time and expense in shipping the weights by freight, one set of twenty in number is kept in the eastern part of the State, one set at Tonopah, one at Las Vegas, and two sets at Reno. The counter scales used by our retail dealers are in very good condition and with but very few exceptions we find only standard, first-class equipment being used, a marked improvement noted over previous years. In the course of our field work we find many scales out of adjustment, due to lack of care on the part of the owner. Oil in the dashpot of computing type of scale, is allowed to become low. This condition causes the scale to work too freely, taking a long time for the barrel to come to rest showing the true weight of the material on the platform, and when the operator is in a hurry a "guess weight" is made. Again, the oil, if not changed occasionally, will become gummy and heavy through long constant use, in which case the scale will lag and to bring the indicator line to the proper point excess of the true weight must be placed on the platform, and the scale works against the dealer. With other types of scales we frequently find the bearings badly corroded and dirty, due to lack of a few drops of oil, or some vital part of the scale is missing or broken.

Such points cannot be excused, for but a little time and attention is necessary to keep counter scales in good condition.

Hundreds of check weights have been made on bread, butter and all kinds and classes of package goods. Whenever shortages are found the offending party is notified and cited to a hearing before the Commissioner. The state weights and measure law requires that all commodities or articles of merchandise be labeled with a statement of weight, measure or numerical count, exception being made to packages put up from bulk for the purpose of delivery. We find that manufacturers and dealers are meeting this requirement.

The term "net weight," or "net measures," mean exclusive of all wrappers, containers, etc. They mean that the actual weight or measure of the commodity in the package must be stated. Weights should be stated in terms of pounds and ounces avoirdupois. Measure should be stated in terms of gallons, quarts and fluid ounces. The weight or measure statement must be conspicuously placed on the label and in legible type.

Following is a tabulated statement of weighing and measuring devices tested during the period covered by this report:

Counter scales	316
Platform scales	44
Miscellaneous scales	29
Measuregraphs	8
Gasoline pumps	153
Oil pumps	6
Total	585

Condemned

Scales	42
Gasoline pumps	6
Total	48

The department is frequently called upon to measure or weigh coal and wood after it has been delivered to the consumer. Cases have been filed against coal dealers for delivering short weight. These requests are becoming more frequent year by year and to facilitate this line of work we hope to be able to install a standard scale at the laboratory. With such a scale it would be a simple matter to check weights on coal or other commodities and would be found more satisfactory than estimating weights by measurement and calculation after the coal had been delivered. In this connection, in my opinion, some person in each of the towns of the State should be designated public-weight master, who would have authority, when called upon to do so, to check coal, hay and other commodities sold in large quantities. I would respectfully recommend that a bill known as "The Public Way Master Bill" be introduced at the next session of the Legislature, the details of such a measure to be worked out by this department.

Last year several shipments of baled hay, from Nevada points to San Francisco and other California towns, were decidedly short from the shippers statement of weight and the question was referred to this department. The hay was outside of our jurisdiction at the time the complaint was made, but an investigation was inaugurated to ascertain the true cause. We found that the consignee was shipping on balers' weights, no account being taken of incorrect weight state-

or other causes. The matter was taken up with the larger hay shippers and this season all of the hay leaving the State has been sold by track-scale weights, these weights being accepted by both consignor and consignee as a basis of settlement, and up to this time no complaint has been received by this department.

In the sale of berries and small fruits, section 15 of the state weights and measure law reads as follows:

Berries and small fruits, whenever sold or offered for sale in this State in boxes, shall be sold or offered for sale in boxes containing a standard dry quart or dry pint, and if said boxes contain more or less than this amount the information must be given the purchaser, or such boxes must be labeled in plain, intelligible English words and figures, with a correct statement of the quantity of its contents.

The larger part of the berries and small fruits sold in this State are shipped in from California points. The California weights and measures laws provides that berries shall be packed in 8, 12, 16, and 28-ounce containers. The produce house with whom this question was taken up stated that to meet the requirements of the Nevada law and pack in containers holding a dry pint or a dry quart would necessarily add to the cost of the product as it would be necessary for them to have special containers made to meet the Nevada requirements. Under the conditions I recommend that a change be made in the state weights and measures law by amending section 16 of the same to comply with the weights and measures laws of California, in so far as the packing of berries and small fruits is concerned.

STATE OF NEVADA

BIENNIAL REPORT

OF THE

STATE ARCHITECT

1919=1920

F. J. DELONCHAMPS, State Architect



CARSON CITY, NEVADA

STATE PRINTING OFFICE

:

:

JOE FARNSWORTH, SUPERINTENDENT

1921

LETTER OF TRANSMITTAL

RENO, NEVADA, February 4, 1921.

HON. EMMET BOYLE, *Governor of Nevada, Carson City, Nevada.*

MY DEAR SIR: At this time I desire to remind you that the Twenty-ninth Session of the Legislature, 1919, appropriated \$520,000 for a building program and made provision for a Supervising Architect at a salary of \$5,000 per annum. On December 31, 1920, \$150,000 of the original appropriation had been expended on completed work, and, at my suggestion, the salary of Supervising Architect was reduced in proportion to the amount of unfinished work, viz., present salary $^{37}/_{52}$ of \$5,000, or \$3,557.70 per annum. It is my intention and proposal to further reduce this salary in a similar manner as other projects now under construction are completed. All work under construction will be completed during the next few months.

Should the present Legislature make but a small appropriation for future buildings, I would respectfully recommend that the Supervising Architect's salary be determined proportionately to the total of the amount of unfinished work and the new appropriation.

Should the amount of unfinished work and the new appropriation be too small to warrant an adequate salary commensurate with the services required, I respectfully recommend that a Supervising Architect be appointed who shall receive for his services the standardized fee as adopted by the American Institute of Architects, viz., six per cent of the cost of construction. In this case the Architect is to pay all expenses in the preparation of plans and specifications.

Thanking you for your consideration in this matter, I am

Yours very respectfully

F. J. DE LONGCHAMPS.

BIENNIAL REPORT

INTRODUCTION

The office of Supervising Architect has been performing the functions for which it was created since April 10, 1919, and, while sufficient number of buildings have not been completed during this short period to make extensive comparisons with private work or state buildings erected under the old system, the following data on costs will plainly indicate that the buildings completed have made a considerable saving to the State, and that sufficient reason exists to continue the department.

It is the purpose of the writer to make an analysis of building conditions at the time of the creation of this office and show what was accomplished under the system installed, and, as a basis of comparison of costs, alternative methods of construction for the same type of buildings are herewith submitted, as well as costs for approximately the same sized jobs in adjoining States.

For the information of the state officials and legislative bodies in the preparation of their budget for the future building program, as well as for the information of those who are not acquainted with the operation of this office, the following pages have been prepared in as clear and concise a manner as is compatible with an intelligent survey of past accomplishment.

HISTORY AND PURPOSE

The office of the Supervising Architect was created by an Act of the Legislature approved April 1, 1919, Chap. 245, Stats. 1919, and acting under this authority Mr. F. J. De Longchamps, Architect, of Reno, Nevada, was appointed to said position by Mr. J. G. Scrugham, State Engineer, April 10, 1919.

Inasmuch as this new office had just been created, certain appropriations made for contemplated building and the building season was opening, hence the problem or organization was the serious question confronting the successful launching of this new office.

The world-war was just terminating and there was a dearth of skilled men to be had, the engineer corps of the army having absorbed most of the efficient engineers of the country. It was necessary that the Supervising Architect devote his energies in securing a suitable engineering staff, together with draftsmen, and start designs at once. To preclude the interference of office work with the engineering and architectural plans which were of first importance, the services of Capt. H. F. McCray, Federal Disbursing Officer, Carson City, were secured as Chief Clerk, who arranged and installed a cost system and took charge of all office details and accounts. By summary action in making application, and by good fortune, the following personnel was secured, which has proven highly satisfactory to all concerned, and their record for efficiency is respectfully submitted as follows:

F. J. De Longchamps.....	State Architect
F. J. De Longchamps.....	Architectural Designer
Edward E. Hoxie.....	Architect
Geo. O'Brien.....	Architect

C. R. Hill.....	Consulting Engineer
*Capt. W. C. Hedcock.....	Structural Engineer
F. O. Broll.....	Mechanical Engineer
J. G. Huntington.....	Civil Engineer
F. J. De Longchamps.....	Estimator
*P. W. De Longchamps.....	Chief Draftsman
R. D. MacPherson.....	Draftsman
L. A. Gulling.....	Draftsman
F. Harvey.....	Draftsman
B. B. Buck.....	Draftsman
R. D. MacPherson.....	Specification Writer
*L. A. Ferris.....	Specification Writer
Mae Short.....	Stenographer
*Capt. H. F. McCray.....	Chief Clerk
F. J. De Longchamps.....	General Inspector
*W. J. Boudwin.....	Construction Engineer
M. J. Curtis.....	Superintendent
C. R. Hill.....	Consulting Engineer
Peter Burke.....	Inspector
L. A. Ferris.....	Inspector
Capt. H. F. McCray.....	Inspector
*E. L. Malsbary.....	Inspector

*Service men.

ORGANIZATION

While the personnel of the office shows a large number of employees, the average number has been very small, as services were dispensed with immediately upon completion of plans, a skeleton organization merely being retained with inspectors for work under construction. In the case of the building for the Highway Department, which department has its own engineers, the necessity of the presence of an inspector from this office was unnecessary as this was ably taken care of by the Highway Department with a saving to the State.

FINANCING OF THE OFFICE

The expenses of the operation of this office are met as follows:

The salary of the Supervising Architect is prorated to the various projects for which appropriations have been made by the State Legislature, in proportion to the amounts so appropriated.

The original rate of salary of the Supervising Architect was \$5,000 per annum, based on building appropriations of \$520,000, which was increased to \$550,000. At the close of the past biennium several buildings have been completed, leaving total appropriations of \$370,000, and accordingly this salary has been reduced in like proportion and is at present \$3,557.70, which will later be reduced as each building or group of buildings is completed.

The services of employees are directly charged to the project upon which service is rendered. A cost system insures the proper charge to each project for the actual service of each employee, a time-card being used which is viced by the proper clerk in charge. An accurate record of the time spent on each project by each employee, and the value of this time based on the rate of salary per hour, also

the actual expenditure connected therewith, is kept as a record of the project. In the case of office management, when service on the various projects is intermittent, the time charged is estimated as accurately as possible, but where service is continuous it is so charged. The expense of blue-prints, material, etc., are accurately segregated and charged to the proper project.

The use of office furniture, tools and equipment, besides rent, telephone, telegrams, postage and many minor incidentals have been furnished without cost to the State by the Supervising Architect personally. The use and expense of two automobiles has also been furnished without cost to the State for the purpose of inspecting the work under construction and reducing traveling expenses.

While the State probably could offer free rent in Carson for this office, it was found upon investigation to be impracticable, as there were no facilities in that city for blue-printing, an important item in giving service to prospective bidders and contractors to whom work had been assigned. Past experience has shown that an ordinary office cannot afford to keep a special man for blue-printing as there is not sufficient work to justify the expenditure. Further, that owing to the dearth of architectural draftsmen and the inability to guarantee steady employment, it was found that the skilled draftsmen preferred to accept work in San Francisco, Salt Lake City or other large cities, and, inasmuch as two large projects were to be in Reno, it would be a great saving to inspect the work directly from this office and thereby make a saving of uncalled-for inspectors which would be necessary if the office was located in Carson City.

A loan of \$10,000 was originally made to carry on the work of the office, which amount has been used as a revolving fund. Suitable vouchers are prepared in triplicate for the State Controller and institutions of the State involved, upon approval of which the revolving fund is further replenished. After work of the various projects had progressed so that bids from contractors could be secured and office expenses could be reduced, on January 19, 1920, the revolving fund of \$10,000 was reduced to \$2,000, thereby saving to the State the interest on \$8,000 and the necessity of carrying such a large revolving fund.

PERIOD COVERED

This office was organized directly after April 10, 1919, at a time when the material market was the most instable in the history of the country, the cost of labor and material were at the highest peak that the country has known, there was a shortage of skilled men for an office force and a large demand for their services in the larger cities with higher wages and more attractions for their comfort than could be offered in Nevada, all of which added to the difficulties that had to be overcome. The results obtained as indicated in the following pages represent, therefore, what has been accomplished under the most unfavorable conditions which have or probably ever will be recorded in the building business. Owing to these conditions the designs carried out were consequently on a less scale than would have been under normal conditions. The figures obtained in open market against competition, however, are considered very satisfactory in relation to the estimates prepared in this office.

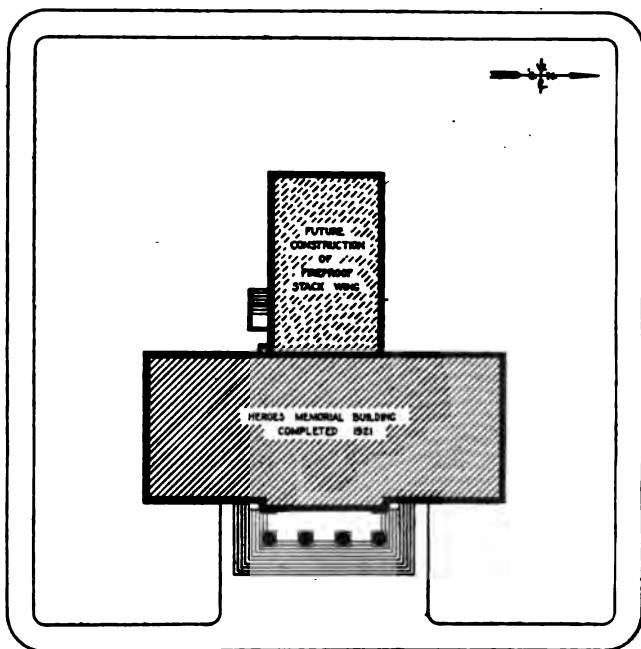


DIAGRAM
SHOWING BUILDING PROGRAM
FOR COMPLETING
HEROES MEMORIAL BUILDING

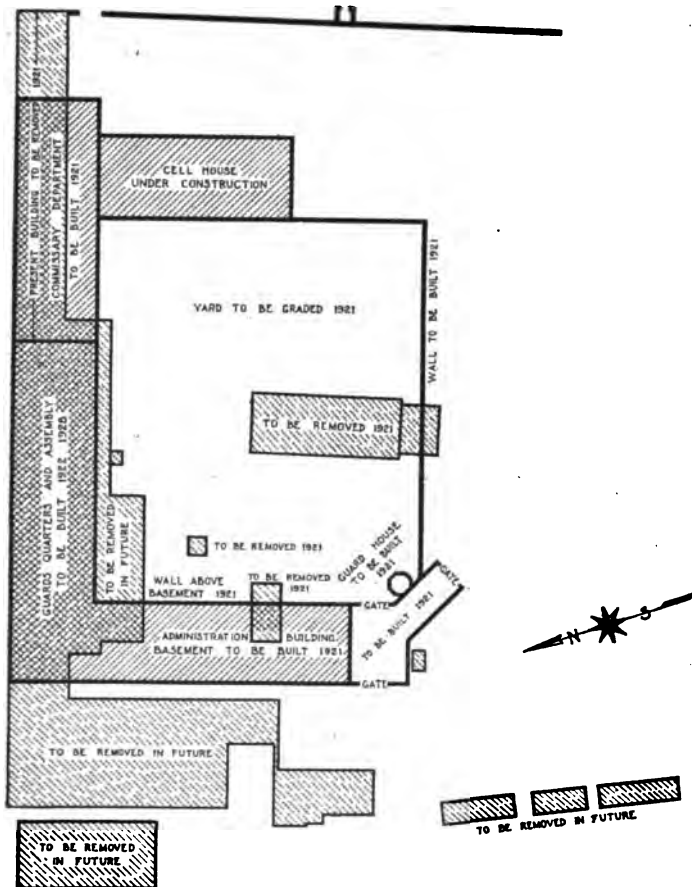


DIAGRAM
SHOWING BUILDING PROGRAM
FOR COMPLETING
NEVADA STATE PRISON

PRELIMINARY WORK

An extensive knowledge of the project in hand is first obtained by visits to the site by the Supervising Architect and by discussions with the head of the institution and his assistants, and by correspondence. The reports and recommendations of the institution heads are perused; reports of similar institutions in other States are obtained, the plans of such institutions are obtained and studied, and then preliminary sketches are prepared and a conference is called at which meeting the vital points are considered separately and final decision concluded on the project as a whole. Upon such final decision estimates are then prepared and complete preliminary sketches submitted to the institution authorities and conference continued and required adjustments made until both the plans and estimated costs are satisfactory.

As no definite building plan for future extension to state institutions has ever been devised, this matter has been given much study, and plot plans have been designed which will simplify construction, promote economy and be of material assistance in the future. This additional work was absolutely necessary, and, while it slightly delayed the completion of some plans and added to the expense of this office, its value is obvious even to the casual observer.

CONTRACTS

Working and full-sized drawings are then prepared, which include the architectural, structural, mechanical and electrical branches of the trades. Specifications are prepared covering all branches of work or trades involved. After legal notice has been published the bids received are opened by the respective boards of commissioners, contracts are drawn and executed, bonds secured and the actual construction is ordered. During certain periods of construction an inspector is kept on the work; during other periods of construction an inspector makes visits to the site, which visits may occur before or after working hours or at any unexpected time during the progress of the work.

The office maintains a constant general supervision over all work under construction by periodical trips, inspectors, superintendents, correspondence, etc.

The auditing of all accounts, payments of all claims and similar work is approved by the Supervising Architect, or the head of the institution; all accounts paid by this office are segregated and charged to the proper institution and then vouchered to that institution for reimbursement to the revolving fund.

DAY LABOR

The method used in handling this type of work is the same as described in "Preliminary Work." Advertising and award of a contract is eliminated and a superintendent suitable for the work proposed is employed who has direct charge of all work.

Complete lists of material for all branches of the work under construction are prepared by the superintendent from time to time as they are required, which method, under the present circumstances, has the advantage of securing material on a declining market.

As the office of Supervising Architect is in touch with the material market, bids are then secured for material needed and the lowest bid accepted. The office also works in conjunction with the superintendent in the securing of skilled labor where necessary. Plans and specifications are prepared, but as the work is directly in charge of a superintendent the work may be started before the completion of the plans and specifications, as the needed information and instructions are given to the superintendent, thereby making a saving of time in the period required for the completion of the work and eliminating the use of additional help in this office, and also taking advantage of the building season before the winter months begin. The expense of labor and mechanics is paid and audited directly by the institution concerned, the salary of the superintendent alone being paid by this office or expenses directly connected with the plans or supervision of work.

MISCELLANEOUS WORK

While it is obvious that the creation of this office was expressly to "Prepare plans and specifications and supervise the construction of all building of the state for the erection of which provision has been made at the present session of Legislature" (Sec. 1, Chap. 245, Stats. of Nevada, 1919), the work performed has been extended to include specifications, securing bids, material, contracts and supervision of repairs, extensions, painting, furniture and fixtures, electrical and mechanical improvements to buildings and advisory recommendations and estimates for future work. In all miscellaneous work the actual time and expense of the employee only is chargeable to the institution concerned, the services of the Supervising Architect being given without cost.

BUILDING PROGRAM

During the growth of the various state institutions in Nevada, covering the past history of the State, no definite building program was in vogue, as a consequence the present heating, electrical, telephone and roadway facilities are inadequate and inefficient and obviously expensive and unsatisfactory.

Plot plans of the most important institutions, with proposed building sites and efficient engineering plans which will adequately provide for future extensions, have been prepared, so that further appropriations may be advisedly expended for future requirements.

ANALYSIS OF TABLE

The table hereto attached gives statistical data regarding the amount of contract of each project, with office and supervising cost and per cent overhead costs, together with estimated amount of work and material furnished in the case of day labor.

Architects' regulation fee for similar private work is shown in a separate paragraph, and, as no rent, office equipment, and minor expenses (see financing of office) are included in office expense, the figures given represent the actual office and inspection cost of the projects to date.

UNCOMPLETED WORK, DECEMBER 31, 1920

Job	Nature of work	Amount appropriated	Amount of contract	Expended on construction	Balance of contract	Amount of work completed	Overhead and inspection
Hospital Mental Diseases	General construction Plumbing and heating Electrical Material not in contract		\$139,800.00 46,700.00 4,547.00	\$36,375.00 6,508.75 1,337.00 80.00	\$102,425.00 40,183.25 3,210.00		
Totals		\$190,000.00	\$190,547.00	\$44,748.75	\$145,828.25	\$52,648.00	\$9,392.53
Heroes' Memorial	General construction Plumbing and heating Oil burner and tank		\$70,696.00 7,178.00 1,068.00	\$19,955.00 428.00	\$51,741.00 7,178.00 683.00		
Totals		\$80,000.00	\$78,932.00	\$19,380.00	\$59,552.00	\$22,800.00	\$3,489.42
Mining Experiment Station	General construction Plumbing and heating Electrical		\$26,900.00 6,833.00 2,290.00	\$11,050.00 3,817.40 547.80	\$15,850.00 3,016.60 1,742.20		
Totals		\$30,000.00	\$35,723.00	\$15,415.20	\$20,308.80	\$23,892.00	\$1,579.10
State Prison	Day work	\$100,000.00				\$50,000.00	\$5,569.89
University of Nevada	Cottage, bunkhouse (not built). Mansanita Hall entrance (not built).						
Totals				\$75.00		\$75.00	\$150.55
Grand totals				\$79,418.95	\$225,689.05	\$149,412.00	\$30,171.49
Material for building							80.00
Total expended by supervising architect							\$30,201.49

*Estimated.

COMPLETED WORK, 1919-1930

Job	Nature of work	Amount appropriated	Expended on construction	Overhead and inspection	Percentage of overhead
Teachers' Training Building— New building with class rooms, offices and auditorium—	General construction		\$32,067.06		
	Plumbing and heating		8,860.00		
	Fixtures		2,221.15		
	Miscellaneous		170.00		
Totals		\$100,000.00	\$33,338.20	\$4,233.52	0.0458
Orphans' Home— Addition to conform to present building	General construction		\$31,840.00		
	Plumbing and heating		6,527.00		
Totals		\$50,000.00	\$38,367.00	\$1,589.29	0.041
School of Industry— Manual training building	General construction		\$5,000.00		
Totals		\$5,000.00	\$5,000.00	\$44.06	0.0088
State Capitol— Improvements and repairs	Painting		\$1,910.00		
	Fixtures		5,988.00		
	Electrical		300.39		
Totals			\$8,208.39	\$65.25	0.00798
Department of Highways— New buildings	Machine shop, Reno		\$7,900.55		
	Garage, Reno.		7,776.00		
	2 machine shops, Ely and Las Vegas (not built).				
Totals			\$15,676.55	\$256.41	0.016
Grand totals			\$160,580.14	\$6,238.53	0.0387

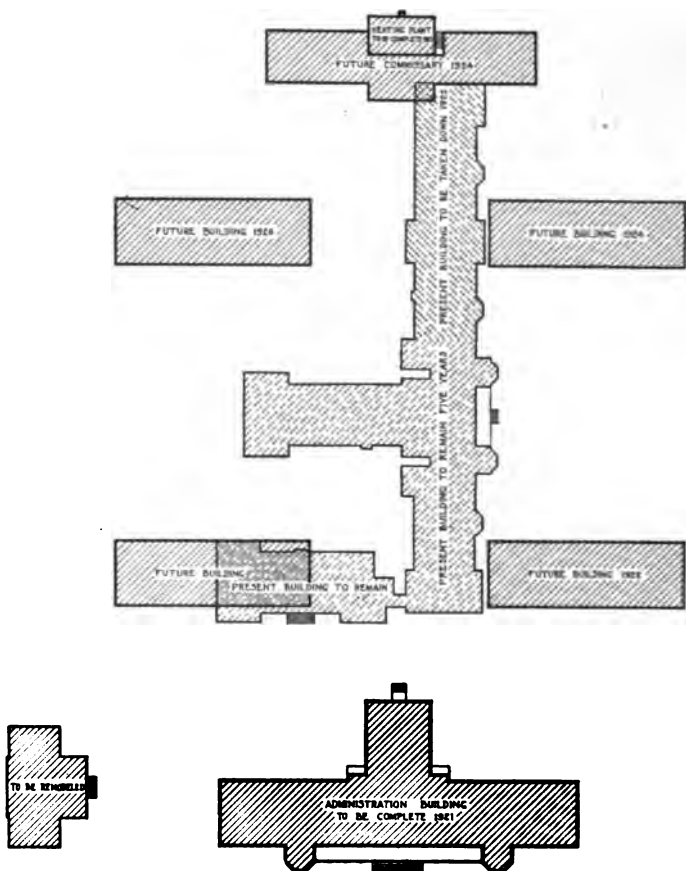
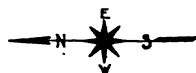


DIAGRAM
SHOWING BUILDING PROGRAM
FOR COMPLETING
NEVADA STATE HOSPITAL
FOR MENTAL DISEASES



TEACHERS' TRAINING BUILDING

The appropriation for this building was \$100,000. The actual cost of construction and fixtures was \$93,338.20, with an overhead expense for plans and supervision of \$4,283.52, or an overhead percentage of .0458.

As comparison with state work being done in other western States will refer to an average job of approximately the same size, viz., cost of construction \$101,158, with an overhead expense of \$8,850, or an overhead percentage of .087.

As comparison with private work under the rules of the American Institute of Architects, will say that the legal fee chargeable to a job of this size would be \$5,600, plus fees for inspection and traveling expense.

ORPHANS' HOME

The appropriation for the addition to this building was \$50,000. The actual cost of construction was \$38,367, with an overhead expense for plans and supervision of \$1,589.29, or an overhead percentage of .041.

As comparison with state work being done in other western States will refer to an average job of approximately the same size, viz., cost of construction \$37,542, with an overhead expense of \$4,703, or an overhead percentage of .125.

As comparison with private work under the rules of the American Institute of Architects, will say that the legal fee chargeable to a job of this size would be \$2,302, plus fees for inspection and traveling expense.

SCHOOL OF INDUSTRY

The appropriation for this building was \$5,000 and the actual cost of construction and fixtures was \$5,000, with an overhead expense of \$44.06, or an overhead percentage of .0088.

As comparison with state work being done in other western States will refer to a job of approximately the same size, viz., cost of construction \$5,241, with an overhead of \$330, or an overhead percentage of .062.

As comparison with private work under the rules of the American Institute of Architects, will say that the legal fee chargeable to a job of this size would be \$300, plus fees for inspection and traveling expense.

HIGHWAY DEPARTMENT

The cost of construction of these buildings was \$15,676.55, with an overhead expense for plans of \$256.41, or an overhead percentage of .016. This also includes plans for two buildings that have not, as yet, been erected, which will necessarily bring the overhead expense down materially when these buildings are constructed.

As comparison with state work being done in other western States will refer to an average job of approximately the same size, viz., cost of construction \$15,787, with an overhead expense of \$1,819, or an overhead percentage of .115, or \$940, plus fees for inspection and traveling expense.

COMPARISON OF ALTERNATE SYSTEMS

Having described in previous chapters the operation of the office, and proportionate overhead expense to the amounts of the various projects, also the relation of these costs to standard fees as set by the American

is obvious. We realize that the deciding factor in favor of the continuance of this office is the element of cost under the present method of administration in relation to the cost of other obtainable methods, as used in open market by the public and as adopted by other States.

The relative cost, as shown in table, while chargeable to their respective projects, also include inestimable service in an advisory capacity, also estimates and assistance by the Supervising Architect to state institutions with reference to small projects—small in importance as to the expending of money, but of vital importance to the department for future improvements, additions, and repairs, some of which have been completed by state labor at a great saving. Under no other method of building procedure could this latter service be obtained without additional cost to the State, as the service would not be available which, under the present system, is given freely and without cost and without loss of undue time, a valuable item in construction work. Without this service the losses occasioned by a single blunder or unintentional omission caused by inexperience or ignorance of the material market would more than offset the supposed saving of building without the advice of an Architect.

ADVANTAGE OF PRESENT SYSTEM

Inasmuch as the percentage overhead cost of each project in comparison with optional methods used by the public and other state architects' offices is the vital point in deciding the value of the continuance of this office, the following points are considered worthy of consideration at this time:

1. Authority and responsibility are centralized and contained in the Supervising Architect.

2. The office becomes a clearing house of ideas and plans for future construction, repairs and additions, and every institution and department of the State receives the benefit and the experience of all the others.

3. Preliminary plans and estimates are prepared for all classes of architectural and structural work, and if not elaborate they are prepared without cost to the State.

4. All plans of state buildings are filed together and are the property of the State. They form an invaluable record, especially when additions, alterations and improvements are contemplated, which cannot be duplicated. This is of vital importance, for, in the past, plans of state buildings have been prepared by various architects who have long since moved from the community and no records are to be found in the archives of the various state offices.

5. The Supervising Architect becomes intimately acquainted with the requirements of the heads of the institutions for the work contemplated, which data is recorded and is invaluable for a building program for future work, information that would otherwise be lost.

6. A more satisfactory result is obtained and a more efficient development of institutions can be obtained than by employing architects and engineers who are constantly changed, who keep no record for future designers and who are not responsible for the scheme, its cost or the future cost of operation to the institution.

7. Small repairs, alterations, etc., so small in value that they could not be attended to by experts without unwarrantedly increasing the overhead expense and making the work prohibitive, would not receive the attention now given them.

with a small force of skilled mechanics, has been found to be satisfactory.

In the case of small miscellaneous jobs for institutions which have state labor at hand, the employment of a superintendent is unnecessary, the head of the institution acting through his assistants having been found to be efficient and satisfactory. In all cases superintendence from this office is furnished from time to time as the work progresses or is required.

Buildings are completed in the shortest possible time consistent with good workmanship. Any excess time consumed in construction materially adds to overhead expense which would be inefficiency on the part of the contract and this office. The tables of overhead percentages are self-explanatory and no other argument should be necessary as a just reason for the continuance of this office.

CUSTOMS OF OTHER STATES

The custom generally used in other States relative to similar problems are usually covered by laws requiring the preparation of sketches and estimates by some competent authority on every item submitted for the consideration of the Legislature, and this amount is either provided in whole or entirely eliminated. Owing to the present material and labor market an accurate estimate made at the present writing would be obsolete and useless in the course of a few months. During the time covered by this report building has been on a rising market, which has made the appropriation of the past Legislature inadequate to construct the type of building proposed and desired without additional funds or the elimination of some of the features contemplated. The same condition has existed in all other States. The future presents a much more favorable aspect for a building program and the guarantee of building costs as estimated at the present writing.

RECOMMENDATIONS

In order to have funds for emergencies applicable to a future building program, also in order to discourage the absorption of an entire building fund by an institutional board, should the building be completed at a less cost than the amount appropriated, which might occur on a declining market, and under the present system of making a special appropriation for each institution, it is respectfully recommended that a lump-sum bond issue or appropriation, covering building development for the entire State, be made—this sum to be administered by a Board of Charities and Corrections in the same manner as the funds of the present Highway Commission are expended, viz. allotted to institutions in accordance with their requirements.





LETTER OF TRANSMITTAL

RENO, NEVADA, January 1, 1921.

To His Excellency, EMMET D. BOYLE, Governor of the State of Nevada.

SIR: In accordance with the provisions of law, I herewith submit a report of the work of the Nevada Historical Society for the biennial term ending December 31, 1920.

Very respectfully yours,

JEANNE ELIZABETH WIER,
Secretary.

REPORT OF THE PRESIDENT

RENO, NEVADA, January 1, 1921.

EMMET D. BOYLE, *Governor, Carson City, Nevada.*

SIR: It is a pleasure to report that under the Executive Council, aided by the valued work of the Secretary and the assistance of members in numerous localities, the Nevada Historical Society has made increased progress in its work of collecting and preserving for the use of present and future generations relics, data and important information concerning the State and her people. This work, as in other commonwealths, has been most satisfactorily done by those who take special interest in its accomplishment. In this State the effectiveness of the work will be further advanced by the recently organized county committees, the members of which are aware of the importance of the effort and are anxious to promote the purposes of the Society.

If adequate funds and needed storage equipment were once provided the work of the Society could be better advanced. Even under adverse financial conditions some additional and fireproof housing, though perhaps only temporary, is imperative for the preservation of materials which will be of great interest and benefit in the future.

Further time is necessary for the proper preparation of the war history which requires much more effort than is ordinarily realized by persons not familiar with such work.

The condition of the Society is better shown by the following detailed report of the Secretary, under whose able supervision its work has been so well advanced. With best wishes for the future and increasing service of the Nevada Historical Society and all other things which will promote the welfare of our State, I am

Yours respectfully,

G. F. TALBOT,
President.

worker by reason of the Secretary's personal labor in field work throughout the summer of 1920. The new volume entitled "Nevada Historical Society Papers, Vol. II," is a three-hundred page book, carrying twenty-nine illustrations. Besides the usual memorial papers it contains the George E. Peckham Reminiscences, poems by Sam P. Davis and Edwin Comerford, and an article by F. N. Fletcher on "The Trappers and Explorers of the Great Basin." In appearance the book conforms in size, paper and type to the best standards of today and it is hoped that all future publications of this Society may be issued in similar form. While somewhat more expensive than the usual state document volume, the more readable and attractive style makes of it a better advertisement for the State as well as a more desirable souvenir for pioneer families.

The Society has published for its county committee work a number of pamphlets and card and leaflet materials which will be mentioned in another connection.

2. WORK OF ARRANGEMENT: To make the collections of the Society of present as well as of future use to the public two things are necessary: (1) the various articles must be placed in an orderly way upon the tables, shelves or walls of the building; (2) a complete catalog record must be made so that any particular article may be readily located. In a crowded temporary building such as ours any attempt at classification and orderly arrangement means the constant shifting of materials from one place to another. This makes a great drain upon the time of the workers, and often for lack of time the exhibits are perforce crowded in without proper sorting. In the matter of cataloging the major part of the books have been catalogued according to the Dewey decimal system, but the pamphlets and broadsides are still waiting the touch of the expert librarian. The Secretary spent the summer of 1919 in making an inventory of the collections in order that an assistant might later be able to make the card accession list which will identify each object in event of the sudden removal of the present Secretary. Miss Browder has been working on this list for the past eighteen months and there still remains much work to be done along this line to bring the record up to date.

3. PERMANENT EQUIPMENT: Most important in the way of permanent improvements was the purchase of the additional lot and temporary annex cited above under II. Without this relief in housing, the Society would have been compelled to close its doors to the public and to have used its narrow aisle room for storage purposes. The securing of additional building ground at a moderate price has been an advantage in making possible the consideration of definite building plans.

Until the biennium just closed the Secretary has made shift to get along with practically no office furniture. With the rapid expansion of the work in 1920, economy of time demanded that some expenditure should be made for office conveniences and for better lighting of the building. After careful consideration this was done, although the sum thus expended was also needed for binding, cataloging, etc.

4. STEPS TOWARD A NEW BUILDING: There has been organized in 1920 in every county of the State a building committee of prominent and energetic state builders, men and women, who have promised to interest themselves and their respective communities in the question

of an adequate fireproof building for the housing of the historical records of Nevada. For the use of these county committees a fourteen-page pamphlet has been issued defining the characteristics of a proper historical archives building, showing the inadequacy of the present structure, giving a summary of the steps taken toward the securing of a building, and stating briefly the types of material which belong to the Nevada Historical Society. As this pamphlet has already been mailed to you and to the members of the Legislature it is unnecessary to here repeat its contents.

5. WAR HISTORY WORK: By Act of the Twenty-ninth Legislature the Nevada Historical Society was directed to collect and compile the war history of Nevada and to prepare a volume setting forth these facts. The Society was to become the custodian of all records and relics belonging to the State. Very soon after the passage of this Act the Federal Government ordered the official war records in the various States and counties transferred to Washington. There they were stored, and pending their final arrangement, were closed to all use by the various States. Without these records no roster of soldiers and sailors could be obtained other than by personal canvass. The plan found most satisfactory by other States in this emergency was adopted by Nevada, that of county war history committees who would assist in their respective localities to obtain the records of service men and women. The Secretary, through personal visitation, has organized all the counties of the State in this way and has carefully prepared the questionnaires for obtaining the data. The records thus collected are filed systematically and will not only furnish the material for the printed war roster but will also comprise a permanent war archives for the State. To obtain the roster and other necessary information for the proposed printed history is, however, a work of time. No State has thus far been able to complete its task no matter how early it was begun nor to how simple terms it may have reduced its problem. A national association of war-history organizations has been formed for the purpose of exchange of material and to maintain in Washington a part-time research worker who will keep the war history agency in each State informed as to the availability of the Washington archives and who will oversee the copying of records as soon as they are available in Washington. The Nevada Historical Society used of its \$5,000 appropriation the sum of \$3,455.13, leaving a balance of \$1,544.87, which reverted to the treasury at the end of the biennium. With the money thus far expended a solid foundation has been laid. With the work of organization well accomplished the Secretary will now be able to secure much volunteer assistance and cheap clerical help for the more mechanical tasks, thus devoting her own time to the editing of the materials and preparation for print. Naturally no use has been made of the amount appropriated for the printing of a one-volume war history.

6. THE WORK OF GENERAL COLLECTION: The Secretary has for many years hoped that the time might come when a thorough personal canvass of the State and Pacific Coast might be made to collect data and relics in an exhaustive way, but the salary of a competent field officer, added to the enormous cost of traveling, makes such a course impossible for the present, hence an appeal has been made to the loyalty and patriotism of Nevadans everywhere throughout the State

to lend their aid to this endeavor of saving the material for the writing of Nevada history. For the purpose of organization, the county has been selected as the unit. In each county a group of responsible and efficient men and women has been named to direct the work. The willing acceptance of these committee appointments by busy men and women has been a source of gratification to the officers of the Nevada Historical Society because it indicates that our people have a deep interest in this work and they realize that if it is to be accomplished it must be done now. Directions for the work of these committees have been issued in pamphlet form, and record cards, report blanks, etc., have insured systematic and united effort throughout the State. In some counties the pioneer collections committee has also undertaken the task of enlisting new members in the Society. In other counties a separate membership committee has seemed desirable. Blanks and forms for this kind of work have also been issued.

During the biennium the increasing interest in our institution has brought to us many valuable items from individual volunteer collectors. Mention can here be made of only a few typical contributions by way of illustration.

Territorial Enterprise Office Papers: Through the kindness of Mr. F. A. Blake and son, when the office of the Territorial Enterprise was dismantled, the Society received bound volumes of the Enterprise for 1876, 1877, 1878, 1880, 1894, 1895, and 1896. It also received partial files for eight other years and partial files of the Footlight for the years 1875-1887, with the exception of 1885. In this collection was also a combination subscription and scrap-book of the Enterprise, a petition circulated during the Spanish-American War for subscription to a fund with which to buy sabre and belt to be presented to the lieutenants of the First Nevada Cavalry, the Reno Arcade Hotel register for 1883, and many other valuable items.

The Golden Souvenirs of Tonopah: From Mrs. M. L. Golden came a collection of Tonopah pictures and other souvenirs of the early days of the camp.

Senator Nixon Mementos: On the occasion of President Wilson's visit to Reno, Mrs. Kate I. Nixon presented the Society with Senator Nixon's favorite chair, to be used by the President, and then to be preserved in the Society museum. A few days later Mrs. Nixon made a further gift in the badge worn by Senator Nixon at the National Republican Convention in Chicago, 1908. With it came the photograph of President Taft autographed by himself and presented to Mrs. Nixon, "the widow of my warm friend, Senator Nixon, with deepest sympathy in her great sorrow. This photograph had been prepared for Senator Nixon before his death. I venture to send it now to her whose irretrievable loss we know and feel."

The Tumulty Hat: On the same occasion of President Wilson's visit a hat was left behind in Reno that promises to become historic, for Mr. Tumulty that evening in the fall very unwillingly left in Reno his straw hat which had made the long tour with the President. Through the kindness of Charles Bull the hat is now in the Society Museum.

King Albert Souvenirs: Another memorable event in Nevada history of 1920 was the trip of King Albert through the State. During the

brief stop of his train in Reno Mayor Stewart obtained for the Society the King's autograph and this, together with the pencil used on that occasion, have been framed with the royal photograph. Later Mr. H. H. Webb, of Santa Barbara, added to this collection the original copy of the King's speech in San Francisco, and the Belgian flag taken from the car of the committee in charge of the Belgian party in Santa Barbara.

White House Wool: Also reminiscent of the participation of Nevada in national affairs is the case containing the White House Wool, which was auctioned in Reno, June 8, 1918, by Governor Boyle for the benefit of the American Red Cross fund. It was bid in for The Union Wool Company at \$2,000 by H. G. Humphrey. The total receipts from the auction were \$4,025.10. Accompanying the wool, when presented to the Society, was a card of thanks signed by President and Mrs. Wilson, and also a vote of thanks from the Vice-President of the American Red Cross.

The Lusitania Trunk: Recalling again the recent war is the small foreign trunk bearing the Lusitania placard. This trunk came to America on the last westward trip of that historic ship and was recently presented to the Society by E. D. Frazzini of Fallon.

Mining Camp Souvenirs: From Mr. Crescenzo of Austin came a set of gambling pictures which hung for many years in the Magnolia saloon. From Austin came also fire hats of the old fire brigade, the gift of W. W. Ellis. A coffee-pot from the Stokes Castle is to be followed after a time by more substantial mementos of that picturesque bit of architecture, now the property of J. F. Byer. Equally interesting in its mute story of the bonanza days of Austin is the silver bar made from ore of the Manhattan mine and given to Robert Pohl as a birthday token on November 14, 1875, by whom it was presented to the Society in the summer of 1920.

Indian Relics: Not a few souvenirs of Indian life have been added to the collection. Of these one of the most interesting is a piece of Indian pottery which was in use by the Indians when Mrs. T. J. Williams came to Hot Creek Ranch in 1870, and was recently placed by her in the State Museum.

Chinese Josh-house Reminders: A nucleus of Nevada Josh-house relics is found in a handsome Josh picture painted on glass which was presented to the Society last summer by Mrs. Laura Adamson of Winnemucca. It was used in the early days in American Canyon. About the same time a wrought brass incense burner came to the collection from Chinatown in Eureka.

Elko County Collection: The large Elko exhibit in the museum is being constantly increased by gifts, both from the Mayer-Bangs family and from other old timers. The latest contribution is a shawl from Mrs. Haws of Tuscarora. It is of cashmere, came originally from near Paris, and was brought to New Orleans in 1838 and thence to Nevada. It is elaborately beaded and embroidered.

Nevada Poetry: This institution has made during the past year a special effort to collect Nevada poetry for preservation in the archives. The immediate incentive for the work was the request which came from the Federated Clubs through its Literature Chairman, Mrs. Geo. West, for material for a symposium of Nevada poetry. Some

eighty-five individual compositions have been received, besides three volumes of poems.

Hank Monk Schottische: Linked by several songs to Nevada poetry is the subject of Nevada music. One of the most highly treasured pieces of music is the Hank Monk Schottische, composed in the early days by J. P. Meder, and carrying on its front page the picture of Hank and the stage coach. In some way this item came into the possession of Miss Grace Lamb, who never fails to pass her treasures on to the Historical Museum.

War-History Souvenirs: Mention has hitherto been made of the war-history records. The beginning of a war museum has been made through the donation by soldier boys of pictures, pins, foreign money and other mementos of the great struggle. These things are *sources of history* quite as truly as the printed page, and should be preserved side by side as part of the same collection.

A California Collector's Estimate of the Nevada Museum: It were desirable, did space permit, to speak of many other items as well as to call attention to the many things which are still needed to visibly illustrate the happenings of the early days. Of the great bulk of work already done the following words of a California collector written to the Secretary a few days since may best express how it seems to an outsider: "Last July, while in Reno, I had a very pleasant visit one forenoon to the Historical Museum, and as I look back and think of the collection you have assembled and what it represents, the more amazed I am, and to think what it all means."

So also Nevada people must come and see for themselves to appreciate what it all means.

IV. FISCAL REPORT FOR 1919-1920 AND RECOMMENDATIONS AS REPORTED TO THE EXECUTIVE COUNCIL AT THE CLOSE OF THE BIENNIIUM.

A. Fiscal Report, 1919-1920

As you are aware, certified expenditures for the Society for State appropriations thereto have been signed by yourselves and audited by the Board of Examiners, all claims having been paid by the State Treasurer in the same manner as with other State departments.

Current Expense Account

Appropriation	\$9,000.00
<i>Disbursements</i>	
Express, freight and transfer.....	\$47.64
Postage	111.14
Light, water, motor	324.70
Fuel	673.50
Telephone and telegrams	75.30
Printing and binding	2,703.53
Library and museum	877.37
Supplies	401.90
Equipment	448.09
Building and grounds	233.09
Traveling	535.54
Salaries and labor	2,556.70
Balance	11.50
	\$9,000.00

Purchase of Lot and Building

Appropriation	\$2,600.00
Purchase of lot and building	2,600.00

War History Account

Appropriation	\$5,000.00
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Disbursements

Express, freight and transfer	\$13.62
Postage	220.49
Telegrams	2.42
Printing	625.25
Books	25.50
Supplies .....	.60
Equipment	328.68
Membership in National	200.00
Travelling	817.07
Salaries and labor	1,221.50
Balance	1,544.87
	<hr/> \$5,000.00

Recommendations to the Executive Council

1. CONTINUATION OF THE COUNTY COMMITTEE SYSTEM OF WORK: Because it seems to be the only practical way for the present of collecting the historical records and because it has enlisted the interest of many people throughout the State.

2. CONTINUATION OF WAR-HISTORY WORK WITH A VIEW TO PUBLICATION: The purely military part of Nevada war history will occupy the one volume for which the Legislature of 1919 made appropriation. The great host of semi-military and civic activities which contributed in this State to the winning of the war should be chronicled also, and to this more difficult because more elusive task the Nevada Historical Society proposes to devote its efforts until all shall have received due recognition.

For the prosecution of this war-history work during the new biennium the Secretary asks for \$5,400, of which \$1,544.87 would be a reappropriation from the previous years. It is clear that provisions should be made for a two-volume instead of a one-volume history. Eastern organizations have estimated that five thousand roster items, allowing four small type lines to a name, is all that can be published in one volume. This would leave no space in a one-volume work for the semi-military and civic activities.

3. LEGISLATION FOR THE USE OF COUNTY FUNDS: In connection with the subject of war history the Secretary begs leave to recommend that legislation be enacted this year permitting the county commissioners to set aside money for the work of county war-history committees. The chief items of expense are clerical help and postage. Housing and filing devices can usually be provided by the county free of charge.

4. THE FULTON MANUSCRIPTS: Mr. R. L. Fulton, during the last years of his life, wrote an interesting article on the construction of the Overland Railroad. Since he was personally associated with the originators of the project as well as with the engineers and others connected with the actual construction, his manuscript is replete with personal reminiscences and anecdotes which make it invaluable as

by the Nevada Historical Society, of which he was the first president and a life member. Agreement had been made to ask the Thirtieth Nevada Legislature for permission to publish the work as an "Extra," and to allow Mr. Fulton to buy a certain number of reprints after the Society quota was complete. To carry into effect this request the Secretary recommends that a request be made of the 1921 Legislature for an appropriation of \$1,000 for the printing of this or other manuscript material left by Mr. Fulton.

5. STREET WORK ON UNIVERSITY AVENUE: During the year 1920 the Reno City Council included Center Street, now known as University Avenue, in its street-paving plan. The assessment for the State property used by the Nevada Historical Society amounted to \$452. As you are aware, the Attorney-General advised the Secretary that this sum might not be paid out of the appropriation made to the Society for its maintenance and support, as, by so doing, the moneys would be diverted from the application intended by the Legislature. He advised that the sum be requested of the Thirtieth Legislature by means of a relief bill. This matter was discussed and duly acted upon by the Council and it is herewith submitted again in this summary of recommendations.

6. WATERPROOF BASEMENT WITH TEMPORARY IRON ROOF: Two years ago it was our hope and expectation that private contributions of considerable size would soon be made for the erection of the first unit of a permanent archives building. But the times, as you well know, have not been propitious for private benefactions. In view of the great need today for economical handling of the State's moneys, it is not deemed advisable to ask for even one complete unit of a new building. However, the need for more and safer housing room is so urgent that it would seem imperative to ask for the construction of a waterproof basement 50x60, to be constructed on the lot to the north of the temporary building. This basement, if properly constructed, would serve permanently as a repository for public documents or newspapers files and should be so built as to furnish the foundation for the first unit of the permanent structure. The State Architect has submitted the figure of \$10,000 as the amount necessary for the construction of this basement with a temporary iron roof.

7. THE STEWART INDIAN COLLECTION: There is in Las Vegas a valuable collection of Nevada Indian baskets and bead-work. Mrs. Helen J. Stewart has, with infinite pains and rare intelligence, made this collection during a period covering nearly a lifetime. For every basket there is a story of its maker and its significance. Mrs. Stewart cannot afford to give this collection outright to the State, yet she desires that it shall remain within the State and will doubtless part with it for a smaller sum than would be asked from an outsider. The Secretary recommends that the Legislature be asked to consider whether it is possible for the State to offer \$5,000 for this collection.

8. MISCELLANEOUS NEEDS: In seeking to atone for a dearth of historical effort in the earlier years of Nevada's growth, the Nevada Historical Society is confronted with so many problems and so many phases of real need that any attempt to enumerate in detail the kinds

of work it is prosecuting or the things which will aid it to more quickly accomplish its purpose would make too long a story for this report. Further progress on a school history of Nevada, which is one of the most crying needs of the State; a survey of state, county and town archives for the compilation of a guide to be used by business men and state officials, as well as by historical writers; an archiving law to bring as many of these local materials as possible together under one roof; larger personal contact with our few remaining pioneers in an effort to preserve their reminiscences; these and many other things are conditioned upon the amount of financial support which the State feels able to afford and upon the cooperative effort of our state officers as well as that of the masses of our citizens. In the hope that our joint recommendation may bring to our aid all that the State can rightfully afford, I submit for your consideration the following budget:

ESTIMATE OF EXPENSES FOR 1921-1922

	<i>Current expense</i>	<i>War History</i>	<i>Total</i>	<i>Total increase over last biennium because of—</i>
Express, freight, and transfer	\$200.00	\$100.00	\$300.00	County committee work
Postage	300.00	500.00	800.00	County committee work
Light, water, motor	400.00	-----	400.00	Raise in rates
Fuel	950.00	-----	950.00	Raise in rates, extra room
Telephone and telegrams	100.00	50.00	150.00	County committee work
Printing and binding	2,500.00	500.00	3,000.00	Hope to use most of this for much needed binding
Library and museum	900.00	100.00	1,000.00	
Supplies	400.00	50.00	450.00	
Equipment	500.00	1,600.00	2,100.00	War-history work and natu- ral expansion
Building and grounds	250.00	-----	250.00	
Membership in National	-----	200.00	200.00	
Traveling	1,300.00	500.00	1,800.00	
Salaries and labor	4,600.00	1,800.00	6,400.00	More clerical help
Totals	\$12,400.00	*\$5,400.00	\$17,800.00	

Desirable for Miscellaneous Purposes

Street work	\$452.00
Waterproof basement	10,000.00
Printing Fulton Paper	1,000.00
Printing War History	10,000.00
Stewart Indian collection	5,000.00
Total	†\$26,452.00

*Of this amount \$1,544.87 reverted at close of this biennium.

†Of this amount \$2,500 reverted from printing of War History this biennium.

The above report was approved by the Council at its annual meeting.

V. RECAPITULATION OF THE NEEDS OF THE SOCIETY

The Secretary has sought in this brief report to state concisely the objects of the Society, to indicate the progress made during the biennium just closed, to call attention to both the hopeful and the discouraging phases of our work, and to frankly state the pressing needs of the organization in order to make desirable progress during the next two years. Only those who know the details of the labor of this or similar organizations and the scope of the plans it has in mind can realize how stupendous is the task which it seeks to accomplish and how earnest is the desire of its officers that it be enabled to press without delay toward the accomplishment of its purpose for which there is but one time possible—the present NOW.

JEANNE ELIZABETH WIER,

Secretary.

IN MEMORIAM

MEMBERS DECEASED

Bannerman, Thomas R.
Bender, O. T.
Bragg, Allen Charles
Brookins, C. J.
Burke, William
Champagne, Henry
Clapp, Hannah Keziah
Clemens, Samuel L.
Cobb, William Allen
Comins, H. A.
Conboile, Joseph Anthony
Creswell, H. T.
Davis, Sam P.
Doten, Mary S.
Elliott, Clarence H.
Faber, Edwin F.
Fisher, Allen
Freeman, John Watts
Fulton, R. L.
Fuss, H. W.
Gallagher, William Crane
Greene, Charles
Griffin, W. E.
Guthrie, J. W.
Harris, Hirsch
Haydon, Thomas Edward

Holcomb, Grove Robert
Holmes, A. W.
Hunter, Mrs. B. E.
Hunter, J. R.
Kelley, Edward Davison
Leavitt, Dr. G. I.
Lee, F. M.
Lewis, Mrs. Leoline M.
Long, Walter S.
Miller, J. A.
Mitchell, Henry K.
Newlands, Francis G.
Nixon, George S.
Noteware, Chauncey M.
Ring, Orvis
Richards, James W.
Riepe, Richard A.
Sadler, Reinhold
Shirley, Robert
Stubbs, Joseph Edward
Summerfield, A.
Van Deventer, Eugene W.
Wedekind, Mrs. Helena
Wier, Adolphus William
Young, John G.

MEMBERS OF THE NEVADA HISTORICAL SOCIETY

HONORARY MEMBER

Clarence Hungerford Mackay

LIFE MEMBERS

Brougher, Wilson
 Dunham, Allen Murray
 *Griswold, Eugene
 Oddie, Tasker L.
 Talbot, Geo. F.

ANNUAL MEMBERS

Acree, Bert
 Adams, Romanzo
 Addenbrooke, B. R.
 Aldrich, Mrs. Emma Grace.....
 Ambrose, Chas. A.
 Anderson, Henry
 Anderson, L. N.
 Anker, Peter
 Anker, Mrs. Peter
 Arentz, Samuel S.
 Armstrong, R. T.
 Averill, Judge Mark R.....
 Ayres, W. H.
 Badt, Mel S.
 Baker, B. F.
 Baker, F. L.....
 Ballard, G. A.
 Balzar, F. B.
 Bangs, Fannie Mayer
 Battles, Reuben
 Beamen, R. W.
 Beemer, E. H.
 Bennett, Col. James S.
 Billinghamurst, Supt. B. D.
 Billinghamurst, Mrs. B. D.....
 Bingham, C. E.
 Bingham, Mrs. Lorraine H.....
 Black, W. C.
 Blake, J. B.
 Boerlin, Henry
 Bonnifield, Wm. S.
 Bonnifield, S. J.
 Booher, W. W.
 Booth, W. W.
 Born, Mrs. L. A.
 Boyle, Mrs. Emmet D.
 Bracken, Mrs. W. R.
 Bradley, Miss Annie

*Died 1921

Brady, Mrs. Geo. W.	Winnemucca
Brandon, T. A.	Winnemucca
Breeze, Mrs. C. D.	Las Vegas
Brockliss, Mrs. J. J.	Gardnerville
Browder, Miss Mary P.	Reno
Brown, F. E.	Pioche
Brown, Mrs. F. T.	Minden
Brown, Judge Geo. S.	Reno
Brown, Hugh H.	Tonopah
Brown, Mrs. Hugh H.	Tonopah
Buck, J. Holman	Mina
Bugbee, Frank E.	Yerington
Buol, Peter,	Las Vegas
Bush, Duane	Winnemucca
Byer, J. F.	Austin
Byer, Mrs. J. F.	Austin
Campbell, C. G.	Callente
Campbell, Dr. J. D.	Pioche
Cannan, James Clyde	Goldfield
Capell, Mrs. Mary Alice	Salt Lake City
Cardinal, Mrs. J. A.	Minden
Castle, Judge H. W.	Elko
Cazier, John H.	Wells
Chafey, Mrs. Nellie M.	Mina
Chaplin, N. H.	Ely
Chartz, A. J.	Carson City
Cheney, Judge A. E.	Reno
Christian, J. W.	Pioche
Church, Dr. Claude H.	Tonopah
Church, Dr. J. E.	Reno
Clark, L. N.	Virginia City
Clark, Theodore W.	Reno
Clark, Willis G.	Virginia City
Cohn, A.	Carson City
Colcord, R. K.	Carson City
Cooke, Mrs. John R.	Pioche
Corbett, Miss Leora	Virginia City
Corkhill, C. C.	Las Vegas
Coryell, H. H.	Wells
Cowles, R. H.	Reno
Cox, F. S.	Yerington
Creel, Lorenzo D.	Reno
Crehore, Capt. L. W.	Fallon
Crisler, Miss Clara	Carson City
Crowley, Rev. D. O.	San Francisco, Cal.
Culverwell, Chas.	Pioche
Curieux, Mrs. Jennie	Tonopah
Cutts, Chas. F.	Reno
Daniels, Lowell	Tonopah
Dangberg, Miss Grace	Minden
Daoust, Miss Freda	Lovelock
Davey, J. W.	Winnemucca
Davis, Capt. Herman	Reno

Denton, J. Less	Callente
Doane, Kristine J.	Gardnerville
Dockweiler, J. H.	San Francisco, Cal.
Dodd, John J.	Lovelock
Dolf, Thomas	Fallon
Doten, S. B.	Reno
Ducey, Dr. J. V.	Goldfield
Dukes, Mrs. Queen Wilson	Yerington
Dunn, Frank T.	Tonopah
Dyer, Mrs. Ed.	Winnemucca
Easton, Wm.	Austin
Eby, Mrs. J. R.	Elko
Eddy, Leo F.	Las Vegas
Ellis, P. B.	Carson City
Ellis, W. W.	Austin
Ernest, H.	Goldfield
Ernest, Mrs. W. C.	Callente
Fall, Mrs. Fred	Mina
Feemster, S. C.	Reno
Finch, J. D.	Reno
Fisler, P. C.	Tonopah
Fitzgerald, Mrs. Walter L.	Goldfield
Fletcher, F. N.	Carson City
Fowler, Miss Hazel	Reno
Fox, Mrs. Frank	Gold Hill
Frank, Mrs. Geo. W.	Pioche
Frazzini, E. D.	Fallon
Freudenthal, Herman E.	Pioche
Friedhoff, Mrs. Frances	Yerington
Fulton, John A.	Grass Valley, Cal.
Fulton, John M.	Reno
Fulton, John Martin, Jr.	Reno
Fuss, Miss Grace	Lovelock
Gallagher, John H.	Ely
Garside, Frank	Tonopah
Gelder, Mrs. J. E.	Yerington
Gifford, H. P.	Carson City
Glass, L. E.	Tonopah
Goodin, Mrs. W. H.	Lovelock
Gosse, Capt. Harry	Reno
Graham, W. B.	Ely
Griffith, E. W.	Las Vegas
Griswold, Mrs. C. W.	Elko
Griswold, Morley	Elko
Guthrie, Chas. W.	Winnemucca
Haight, A. L.	Fallon
Hale, Harold	Elko
Haley, J. E.	Ely
Hancock, W. C.	Battle Mountain
Harding, Miss Zua J.	Washington, D. C.
Hardy, Mrs. Roy	Gold Hill
Harmon, H. A.	Las Vegas
Harrington, W. P.	Carson City
Harris, Lee	Eureka

Harris, W. J.	Reno
Hawkins, D. R.	Genoa
Hawkins, L. O.	Winnemucca
Henderson, A. S.	Las Vegas
Henderson, Mrs. John	Elko
Hershiser, Dr. A. E.	Reno
Hesson, A. W.	Elko
Heward, Harlan L.	Reno
Hinman, A. A.	Las Vegas
Houlahan, J. A.	Goldfield
Houlahan, John H.	Goldfield
Howe, Miss Lotta Sybil	Half Moon Bay, Cal.
Huffaker, Mrs. Anthony	Carson City
Hunting, Bishop, G. C.	Reno
Hunting, Supt. W. J.	Carson City
Hurst, Glenn D.	Reno
Hussman, Geo. G.	Minden
Hymer, Mrs. Beulah H.	Reno
Im Oberstag, Miss S.	Caliente
Jahn, Mrs. A.	Lovelock
Jepsen, H. C.	Minden
Johnson, Adam	Eureka
Johnson, Karl D.	Battle Mountain
Judson, Gilbert R. S.	Yerington
Jurgenson, John A.	Lovelock
Kane, Jos. W.	Carson City
Keddle, W. A.	Fallon
Kelth, Chas. H.	Lovelock
Kenney, J. J.	Virginia City
Kent, C. E.	Stillwater
Kent, Ira H.	Fallon
Kent, Ira L.	Fallon
Kent, J. F.	Los Angeles, Cal.
Kilborn, Geo. D.	Reno
King, M. J.	Yerington
Knemeyer, Miss Bertha C.	Elko
Lamb, Miss Grace M.	Sharp
Lamon, O. M.	Elko
Langan, Judge F. P.	Virginia City
Lavenga, J. B.	Fallon
Layman, J. D.	Reno
Leavitt, Dr. G. E.	Yerington
Lee, M. L.	Pioche
Lemaire, Louis A.	Battle Mountain
Leonard, James A.	Virginia City
Leonard, Mrs. James A.	Virginia City
Lewers, Robert	Reno
Licking, Mrs. William	Battle Mountain
Likes, G. W.	Fallon
Lillis, Judge H. M.	Las Vegas
Livingston, A.	Winnemucca
Lockhart, James M.	Ely
Luce, Ben D.	Tonopah

Macallan, A. G.	
McBride, B. G.	
McCain, Lella	
McCain, Marion	
McCarthy, A. J.	
McCarthy, J. A.	
McCarthy, Dr. J. L.	
McDonald, Mrs. Etta Comins	
McGill, W. N.	
McGill, Mrs. W. N.	
McGinn, Miss M.	
McGowan, Mrs. John	
McInnis, Wm. Henry	
McIntosh, C. H.	
McKenzie, Miss M.	
McLeod, Chas.	
McNamara, Joe	
McQuillan, Mrs. J. J.	
Mack, Miss Margaret	
Mack, Mrs. Maurice	
Mackey, W. U.	
Maestretti, A. J.	
Marsh, H. G.	
Martin, Annie H.	
Martin, Mrs. Roy	
Maute, Andrew	
Maxwell, Wm.	
Mayer, W. R.	
Miles, Mrs. J. F.	
Millar, Mrs. Rita D.	
Miller, J. A.	
Montrose, Geo. A.	
Moore, Boyd	
Morton, D. E.	
Mulle, Miss Lavina	
Murphy, Ed.	
Murrish, Mrs. H. J.	
Nenzel, R.	
Nevin, Mrs. M.	
Nichols, Mrs. Annie B.	
Norcross, Mrs. Frank H.	
Oats, John	
Oldfield, F. D.	
O'Neill, Mrs. R. C.	
Orr, R. R.	
Orr, Judge Wm. E.	
Park, Dr. W. S.	
Patrick, E. T.	
Peacock, Mrs. Adline Brandon	
Peckham, Geo. E.	
Penrose, M. R.	
Perazzo, Mrs. Bessie	
Perazzo, J. P.	

Phillips, W. S.	Goldfield
Pierson, C. G.	Reno
Pittman, Vail	Ely
Plummer, Mrs. Edna Covert	Eureka
Plummer, T. F.	Eureka
Pohl, Robert	Austin
Poulin, Tiffany	Winnemucca
Pratt, Walter E.	Reno
Price, Robert M.	Reno
Proctor, A. J.	Ely
Proctor, Mrs. A. J.	Ely
Quinlan, J. J.	Virginia City
Reid, Dr. H. E.	Reno
Reid, John T.	Lovelock
Ricketts, V. L.	Goldfield
Roberson, H. C.	Goldfield
Roberts, Mrs. P. B.	Winnemucca
Robins, C. E.	Winnemucca
Roeder, J. F.	Pioche
Rogers, Mrs. Molly	Ely
Roland, Chas. H.	Wells
Rose, George	Winnemucca
Rose, Mrs. V. L.	Battle Mountain
Ross, Paul L.	Reno
Rullison, Chas. H.	Reno
Russell, Miss Ruth A.	Elko
Russell, W. H.	Eureka
Ryan, James	Callente
Samuels, Frank W.	Reno
Schneider, John P.	Fallon
Scott, A. L.	Pioche
Scott, Jos. D.	Winnemucca
Seare, Mrs. Walter E.	Las Vegas
Selkirk, Bert	Gardnerville
Sessions, J. O.	Reno
Settlemyer, F. H.	Gardnerville
Sharon, W. E.	Virginia City
Shea, Mrs. Dan J.	Austin
Sheehan, J.	Winnemucca
Sherman, A. A.	Ely
Show, Arley B.	Stanford University, Cal.
Silk, Mrs. J. J.	Las Vegas
Silva, Dr. Antonia C. S.	Rio de Janeiro
Skillman, Mrs. A. E.	Eureka
Slavin, Chas. L.	Tonopah
Slosson, H. L.	San Francisco, Cal.
Smith, Dr. E. K.	Lovelock
Somers, Peter J., Jr.	Goldfield
Spencer, Mrs. L. B.	Mina
Spilman, C. F.	Reno
Sprague, Mrs. Chas. S.	Las Vegas
Springmeyer, F. G.	Gardnerville
Stannard, G. B.	Hawthorne
Starkweather, W. D.	Lovelock

Steninger, E. M.	Elko
Stern, J. H.	Carson City
Stewart, Mrs. Helen J.	Las Vegas
Stewart, H. E.	Reno
Stewart, Miss Rose	Carson City
Stickney, F. O.	Yerington
Stickney, Mrs. F. O.	Yerington
Stoker, Mrs. Bert	Lovelock
Squires, C. P.	Las Vegas
Squires, Mrs. C. P.	Las Vegas
Sullivan, Dr. J. J.	Reno
Summerfield, L. D.	Reno
Summerfield, S. M.	Mina
Summerfield, Mrs. Sardis	Reno
Swick, Raymond	Eureka
Taber, Mrs. A. D.	Elko
Taber, Judge E. J. L.	Elko
Taylor, Geo. H.	Reno
Taylor, J. G.	Lovelock
Thompson, Mrs. C. A.	Pioche
Tidd, C. C.	Yerington
Tobin, C. L.	Winnemucca
Toombs, Mrs. W. R.	Elko
Triplett, F. H.	Battle Mountain
Turner, H. W.	Pioche
Unlacke, C.	Lovelock
Van Devort, T. D.	Carson City
Van Devort, Mrs. T. D.	Carson City
Van Derwerker, J. L.	Reno
Von Dorman, Miss Elsie	Goldfield
Waggoner, Fannie McKay	Yerington
Walker, Chas. A.	Ely
Walsh, Judge J. E.	Goldfield
Way, C. M.	Fallon
Weber, Mrs. John	Ely
Webster, Mrs. Gertrude	Yerington
West, Mrs. Annle	Yerington
West, Geo. F.	Yerington
West, Mrs. Geo. F.	Yerington
Westfall, Mrs. Vernon	Lovelock
Whitacre, E. H.	Yerington
White, J. H.	Hawthorne
White, Mrs. J. H.	Hawthorne
Whiteley, Geo.	Ely
Whorton, Geo. L.	Yerington
Wier, Jeanne Elizabeth	Reno
Wilcox, S. W.	Reno
Williams, D. E.	Fallon
Williams, E. L.	Reno
Williams, Frank	Goodsprings
Williams, Mrs. Geo. B.	Fallon
Williams, H. O.	Virginia City
Williams, Otto T.	Elko
Williams, Roy T.	Minden

Winter, E. E.	Fallon
Withers, T. L.	Reno
*Woodbury, J. P.	Carson City
Wright, C. C.	Winnemucca
Wyatt, E. L.	Walley Springs
Young, Mrs. J. G.	Wabuska
Young, L. S.	Lovelock
Young, Wayne	Fallon
Yount, S. E.	Los Angeles
Zadow, Mrs. Sophie	Eureka

Died 1921

NEWSPAPERS—MEMBERS EX OFFICIO WHILE SENDING PAPERS

Austin: Reese River Reveille.
 Battle Mountain Scout.
 Carson City Daily Appeal.
 Carson City News.
 Ely Daily Times.
 Ely Record.
 Ely: White Pine News.
 Eureka Sentinel.
 Fallon: Churchill County Eagle.
 Fallon: Churchill County Standard.
 Gardnerville: Nevada Lutheran.
 Gardnerville: Record-Courier.
 Goldfield News.
 Goodsprings Gazette.
 Hawthorne: Walker Lake Bulletin.
 Las Vegas: Clark County Review.
 Las Vegas Age.
 Logandale: The Oak.
 Lovelock Review-Miner.
 Mina: Western Nevada Miner.
 Pioche Record.
 Reno: Nevada Mining Press.
 Reno: Nevada State Journal.
 Reno Evening Gazette.
 Reno: Nevada News Letter.
 Reno: U. of N. Sagebrush.
 Sparks Tribune.
 Tonopah Miner.
 Virginia Chronicle.
 Wells: Nevada State Herald.
 Winnemucca: Humboldt Star.
 Winnemucca: The Silver State.
 Yerington: Mason Valley News.
 Yerington Times.
 Los Angeles: Western Highway Builder.

STATE OF NEVADA

BIENNIAL REPORT

OF THE

STATE ORE SAMPLER

1919-1920

FRANCIS CHURCH LINCOLN
State Ore Sampler



CARSON CITY, NEVADA

STATE PRINTING OFFICE : : : JOE FARNSWORTH, SUPERINTENDENT

1921



LETTER OF TRANSMITTAL

STATE MINING LABORATORY,
RENO, NEVADA, January 11, 1920.

HON. EMMET D. BOYLE, *Governor of Nevada, Carson City, Nevada.*

DEAR GOVERNOR BOYLE: I take pleasure in presenting herewith the biennial report of the State Ore Sampler for 1919-1920.

Together with this report, I am sending you copies of the monthly reports of Nevada purchasers of custom ores. These copies are intended for your files and should not be made part of the State Ore Sampler report.

Very truly yours,

FRANCIS CHURCH LINCOLN,
State Ore Sampler.

BIENNIAL REPORT

1. LAW AND ORGANIZATION

The State Ore Sampler law is chapter 142 of the Nevada Statutes of 1919, approved March 27, 1919. The State Ore Sampler Department succeeded the State Assayer and Inspector Department created by chapter 234 of the Nevada Statutes of 1917, the history of which to November 30, 1918, was covered in the biennial report of the State Assayer and Inspector for 1917-1918. The new law practically continued the State Assayer and Inspector law, while increasing the scope of the work. The State Assayer and Inspector could inspect sampling and assay pulps of shipments made to Nevada purchasers only, while the State Ore Sampler can perform this service for Nevada shippers, no matter where their shipments may be purchased. The State Ore Sampler is also permitted greater latitude in fixing his charges than was the State Assayer and Inspector.

Dr. Francis Church Lincoln, who formerly held the position of State Assayer and Inspector, became State Ore Sampler; Mr. Henry E. Higgins continued as chemist for the new department; and Mr. D. H. Allen continued to act as deputy at the Hazen sampler of the Western Ore Purchasing Company, with occasional assistance from Mr. Fred T. Abbey. Dr. Lincoln made trips to California and Utah, visited the samplers and smelters where Nevada ores were purchased, and appointed deputies to take charge of shipments originating in Nevada. Mr. W. E. West was appointed deputy at Salt Lake City to supervise sampling at Murray, Midvale, and Garfield; Mr. George Howarth was appointed deputy at Tooele, Utah, to supervise sampling at the International Smelter; Mr. Charles Kunze was appointed deputy at Kennett, Calif., to supervise sampling at the Mammoth Smelter; and Dr. Abbot A. Hanks was appointed deputy at San Francisco, to supervise sampling at the Selby Smelter and at the Nichols Plant of the General Chemical Company.

2. OBJECT

The object of the State Ore Sampler is to encourage the operation of prospects and small mines by providing a reliable and inexpensive method of supervising the sampling and assaying of their shipments. The small shipper cannot usually afford to undertake this work himself, and the State Ore Sampler performs a valuable service for him by checking the weight and moisture of each lot, supervising the sampling, and assaying the pulp. The State Ore Sampler has the confidence of both shipper and purchaser, and not the least of his services has been the removal of friction between these opposing interests.

3. MODE OF OPERATION

Shippers make requests for the services of the State Ore Sampler Department by writing to its main office at the State Mining Laboratory in Reno, Nevada. They are asked to mark their bills of lading "Care Nevada State Ore Sampler" in order to avoid possible delay. Upon receipt of a request for service, the State Ore Sampler notifies his deputy at the sampling point to be on the lookout for the lot and

his notification from the Reno office, the deputy takes charge of the shipment without awaiting instructions.

The deputy notes the condition of the shipment upon its arrival at the sampler, checks its weight, inspects the sampling, and checks the moisture determination. He inspects the preparation of the pulp, and mails a portion of it to Reno, where it is promptly assayed in the State Mining Laboratory. From the reports of his deputy and chemist, the State Ore Sampler prepares a complete report, which is mailed to the shipper upon the day the assay is completed.

The general charge made by the department is 25 cents per ton, but minimum charges vary somewhat in different localities. The minimum charge at Hazen is \$5 on lots of less than 20 tons; at the Mammoth Smelter in California and at the Midvale, Murray, Garfield, and Tooele Smelters in Utah, it is \$6.25 on lots of less than 25 tons; while at the Selby Smelter and at the Nichols Plant of the General Chemical Company in California it is \$7.50 on lots of less than 30 tons. The deputy notifies the purchaser of the amount of this charge, and the purchaser deducts the sum from the returns to the shipper and forwards a check for the amount to the State Treasurer of Nevada in Carson City, who places it in the State Ore Sampler Fund, from which all the deputies are paid.

4. WORK OF THE DEPARTMENT

During the period of twenty-one months from March 27, 1919, to December 30, 1920, the State Ore Sampler took charge of 128 shipments by 56 shippers from 26 localities to 5 different purchasers. During the five months from November 30, 1918, to March 27, 1919, the State Assayer and Inspector supervised 9 shipments. As these 9 shipments were not included in the biennial report of the State Assayer and Inspector for 1917-1918, they have been recorded in the present report, raising the total number of lots to 137. Details as to localities, shippers, buyers, number of lots, tonnages, and characters of ore, will be found in Table I.

Six lots were sampled at the Midvale Smelter of the United States Smelting, Refining and Mining Company, and 6 at the Midvale Sampler of the Utah Ore Sampling Company, while 7 were sampled at the Murray Plant of the American Smelting and Refining Company. One lot was sampled at the International Smelter at Tooele, bringing the total for Utah samplers up to 20. No lots were supervised in California. In Nevada the State Ore Sampler took charge of 117 lots, all shipped to one purchaser, the Western Ore Purchasing Company, at Hazen. Four deputies were employed in this work, the details of which are shown in Table II.

All assaying was performed by Mr. Henry E. Higgins in the State Mining Laboratory. The number, character and results of assays are shown in Table III.

The State Ore Sampler law, like the State Assayer and Inspector law which preceded it, requires all Nevada ore purchasers to make monthly reports. The reports made to both the old and the new department have been compiled and are presented in Table IV. The recent great falling off in the quantity of custom ore purchased in Nevada is notable. This reflects the growing depression in the mining

industry and points to the reason why the volume by the State Ore Sampler has not been larger.

5. RECEIPTS AND DISBURSEMENTS

The department had an unexpended balance in \$775.71, which reverted to the State on January 1, 1920. It had an unexpended balance remaining in its fund, and is therefore one of the few state departments which have an appropriation and whose funds were adequate.

6. RECOMMENDATIONS

The work of the department has decreased under the influence of increasing, as it was confidently believed would be a decrease has been due to the closing down of prospecting as a result of the general mining depression which the State is experiencing. Had it not been for the advance in the mining depression, the work of the State Ore Sampler would have shown an increase. It does not, however, seem probable that the Ore Sampler will ever be called upon to handle the large volume of business; and it would, therefore, appear in the future that its work under a distinct state department.

The work of the State Ore Sampler is highly appreciated by the shippers of Nevada, as is proved by the continued interest shown by those who have once employed its service. It is appreciated outside the State, for several inquiries have been asking whether it would be possible for the department to sample lots of ore originating in California. In January, 1920, a questionnaire was sent to all shippers asking whether the Ore Sampler Department should be continued, and the replies received, but one was unfavorable. It was generally desirable to continue the service now offered by the department under some other state department.

Assaying for the State Ore Sampler has been placed in the Mining Laboratory, the public-service mining division of Nevada. There is at the present time a great deal of interest for further mining public-service work in the State, and all these facts into consideration, the State Ore Sampler should be placed under the supervision of the Board of Regents of Nevada, and that the work now carried on by the State Ore Sampler Department and by the State Mining Laboratory be placed in this new bureau. The State Ore Sampler appropriation for the biennium was \$5,800, and the State Mining Laboratory for the same period \$6,600. If to these amounts \$10,000 were added, it would be sufficient to establish the proposed State Bureau of Mines, which would undertake to collect and disseminate information both alone and in cooperation with the United States Geological Survey and the United States Bureau of Mines, and at the same time the work of the State Ore Sampler and the State Mining Laboratory. For such geological work (amounting probably to \$10,000 per annum) as the bureau might undertake, it could reasonably be expected that the United States Geological Survey would match it dollar for dollar; and the new bureau would also be

obtaining the greatest amount of assistance for Nevada from the recently established Precious and Rare Metals Station of the United States Bureau of Mines at the University of Nevada.

Respectfully submitted,

FRANCIS CHURCH LINCOLN,

State Ore Sampler.

TABLE I—PATRONS OF THE STATE ORE SAMPLER DEPARTMENT
From March 27, 1919, to December 31, 1920

Locality	Patron	Purchaser	Lots	Pounds	Character
Austin	Washington Canyon Mining Company	Western Ore Purchasing Company	1	50,100	Gold, silver, copper
Battle Mountain	Henry R. Lemaire	American Smelting and Refining Company	1	38,131	Gold, silver, copper
Broken Hills	Williams, Rollins & Sawyer	Western Ore Purchasing Company	1	8,850	Gold, silver, lead
Candelaria	Broken Hills Silver Corporation	Western Ore Purchasing Company	1	24,260	Gold, silver, lead
	C. E. Noble	Western Ore Purchasing Company	2	70,563	Gold, silver, lead
	C. E. Noble	Utah Ore Sampling Company	1	26,065	Gold, silver, lead
	Montgomery & Renfro	Utah Ore Sampling Company	1	92,200	Gold, silver, lead
	R. R. Newell	Western Ore Purchasing Company	6	288,530	Gold, silver, lead
Coaldale	Jess Mellan	Western Ore Purchasing Company	2	7,440	Gold, silver, lead
Fallon	Arthur & Stratford	Western Ore Purchasing Company	2	105,660	Gold, silver, lead
Gold Creek	Hammond Exploration Company	United States Smelting and Refining Company	1	4,830	Gold, silver, lead
Goldfield	Hammond Exploration Company	American Smelting and Refining Company	1	1,604	Gold, silver, lead
Hawthorne	Montezuma Silver Mines Company	Western Ore Purchasing Company	1	7,803	Gold, silver, lead
Imlay	M. C. Hamlen	Western Ore Purchasing Company	1	9,210	Gold, silver, lead
	Maubach, Fresno S. M. Co., C. E. Crawford, Mgr.	United States Smelting and Refining Company	1	51,290	Gold, silver, lead
	Paul Ciac	Western Ore Purchasing Company	1	10,818	Gold, silver, copper
Keeler, Calif.	W. R. Wallace	Western Ore Purchasing Company	1	12,105	Gold, silver, lead
Leadville	Comrade Silver Lead Mining Company	United States Smelting and Refining Company	1	141,758	Gold, silver, lead
Luning	United Lodi Mining Company	Western Ore Purchasing Company	4	45,140	Gold, silver, lead
Masonic, Calif.	Kibble-Cook Mining Company	Western Ore Purchasing Company	1	272,178	Gold, silver, lead
	H. C. Decker	Western Ore Purchasing Company	13	6,558	Gold, silver, lead
Mill City	Peter Organ	Western Ore Purchasing Company	1	993	Gold, silver, lead
Mina	B. F. Baker	Western Ore Purchasing Company	1	37,062	Gold, silver, lead
	Fagan Consolidated Mining Company	Western Ore Purchasing Company	3	57,120	Gold, silver, lead
	R. C. Miller	Utah Ore Sampling Company	1	48,717	Gold, silver, lead
	Silver Gulch Mining Company	Western Ore Purchasing Company	1	16,120	Gold, silver, lead
	P. A. Simon	Utah Ore Sampling Company	1	5,755	Gold, silver, copper
Nolan Spur	Lew Little	Western Ore Purchasing Company	1	43,660	Gold, silver, copper
Olinghouse	Duffy & Sisson	Western Ore Purchasing Company	1	4,095	Gold, silver
Ramola	A. H. Barlow	Western Ore Purchasing Company	1	19,060	Gold, silver
Rand	Nevada Rand Mining Company	Western Ore Purchasing Company	1	154,535	Gold, silver
Rawhide	A. E. Rogers	Western Ore Purchasing Company	2	15,470	Gold, silver
	Harry Casey	Western Ore Purchasing Company	4	2,870	Gold, silver
	C. W. Covey	Western Ore Purchasing Company	1	2,101	Gold, silver
	J. J. Ferrette	Western Ore Purchasing Company	1	44,458	Gold, silver
	W. B. Fitzgerald	Western Ore Purchasing Company	6	42,337	Gold, silver
	W. H. Leonard	Western Ore Purchasing Company	4	2,585	Gold, silver
	A. I. Rosenberg	Western Ore Purchasing Company	1	34,551	Gold, silver
	P. J. Salmon	Western Ore Purchasing Company	1	575	Gold, silver
	Salmon & Flynn	Western Ore Purchasing Company	1	112,176	Gold, silver
	Salmon & Ross	Western Ore Purchasing Company	1	11,940	Gold, silver
	F. C. Schaff	Western Ore Purchasing Company	1	13,720	Gold, silver
	A. F. Sisson	Western Ore Purchasing Company	16	283,829	Gold, silver
		Western Ore Purchasing Company	4	5,264	Gold, silver

TABLE I—Continued

Locality	Patron	Purchaser	Lots	Pounds	Character
Rawhide (continued)	J. O. Strand	Western Ore Purchasing Company	5	14,387	Gold, silver
	Strand & Boggs	Western Ore Purchasing Company	2	10,867	Gold, silver
	D. K. Wilkinson	Western Ore Purchasing Company	1	1,028	Gold, silver
	Wilkinson	Western Ore Purchasing Company	1	3,679	Gold, silver
Strom	Strom Silver Lead Mining Company	Western Ore Purchasing Company	1	74,300	Gold, silver, lead, zinc
Sweetwater	Nevada Progressive Gold Mining Co.	Western Ore Purchasing Company	2	37,950	Gold, silver
Tenopah	Consolidated Spanish Belt Silver Mining Co.	International Smelting Company	1	79,020	Gold, silver, lead, zinc
	Consolidated Spanish Belt Silver Mining Co.	Western Ore Purchasing Company	1	85,720	Gold, silver
Valmy	J. A. Barngrover	Utah Ore Sampling Company	1	57,320	Gold, silver
	L. K. Kramer	American Smelting and Refining Company	1	87,080	Gold, silver
	Kramer & Barngrover	Western Ore Purchasing Company	1	89,020	Gold, silver
Virginia City	Comstock-Phoenix Mining Company	Western Ore Purchasing Company	1	24,143	Gold, silver
	Doherty & Harris	Western Ore Purchasing Company	4	40,827	Gold, silver
Winnemucca	First National Bank	Western Ore Purchasing Company	1	32,620	Gold, silver
	J. B. Ratliff	Western Ore Purchasing Company	1	21,770	Gold, silver
	56 shippers	5 purchasers	137	2,842,287	

TABLE II—SUPERVISION OF SAMPLING

Inspector	Lots	Purchaser
F. T. Abbey	2	Western Ore Purchasing Company.
D. H. Allen	115	Western Ore Purchasing Company.
Geo. Howarth	1	International Smelting Company.
W. E. West	19	7 American Smelting and Refining Company.
		6 United States Smelting and Refining Company.
		6 Utah Ore Sampling Company.
Total	137	7 American Smelting and Refining Company.
		1 International Smelting Company.
		6 United States Smelting and Refining Company.
		6 Utah Ore Sampling Company.
		117 Western Ore Purchasing Company.

TABLE III—LIST OF ASSAYS

Lot	Smelter lot	Gold, ounces	Silver, ounces	Copper, per cent	Lead, per cent	Zinc, per cent	Ins., per cent	Iron, per cent	Other substances, per cent
A189	8548	0.57	150.13						
A190	8556	7.86	117.00						
A191	8562	3.25	101.25						
A192	8567	0.33	234.37						
A193	8573	8.35	129.73						
A194	8575	1.26	38.12						
A195	8590	9.74	1,146.45						
A196	8661	12.48	201.90						
A197	8684	16.4	262.4						
1	8784	12.70	419.56						
2	8793	0.99	30.4						
3	8806	0.86	26.74						
4	8813	0.03	32.52						
5	8833	0.86	25.39						
6	8864	0.22	230.98						
7	8886	8.56	247.44						
8	8889	0.37	37.88						
9	8896	81.20	70.34						
10	8897	0.68	66.80						
11	8903	5.58	19.17						
Murray No. 1		1.03	0.78						
12	8905	82.58	82.40						
13	8907	0.03	3.41	7.73					
Murray No. 2		2.33		1.86			62.6	9.65	Speiss 42.1
14	8922	12.22	32.51						
15	8923	12.13	22.19						
Murray No. 3		0.02	423.96						
Murray No. 4		0.045	2,010.56						
Murray No. 5		0.01	209.0						
Murray No. 6		0.06	1,102.8	5.03					
Murray No. 7		Trace	41.82						
16	8928	3.2	90.32	9.5					
17	8930	2.14	53.38						
18	8940	25.86	68.17						
Garfield No. 1		0.01	53.24						
19	8952	0.04	19.52		15.9				
20	8956	14.90	461.20						
21	8957	5.05	641.15						
22	8961	6.04	11.42						
23	8964	15.42	19.41						
24	8966	5.70	31.90						
25	8967	0.17	93.68		9.4				
26	8976	13.74	16.44						
27	8980	6.48	26.51						
28	8985	5.0	582.76						
29	8986	0.57	50.43						
30	8987	11.26	11.54						
31	8997	1.01	35.22						
32	9001	12.25	13.63						
33	9003	12.48	239.96						
34	9004	0.85	18.18						
35	9011	0.08	35.18						
36	9012	11.89	13.65						
37	9026	0.10	167.24						
38	9028	0.60	89.04						
39	9036	16.48	24.14						
40	9039	0.06	30.66						

TABLE III—Continued

Lot	Smelter lot	Gold, ounces	Silver, ounces	Copper, per cent	Lead, per cent	Zinc, per cent	Ins., per cent	Iron, per cent	Other substances, per cent
Garfield									
41	9046	8.50	92.05						
42	9047	8.10	29.67						
43	9048	2.50	107.72						
44	9049	0.48	68.74		62.39				
45	9050	0.48	52.86						
46	9051	0.82	32.42						
47	9052	6.24	357.25						
48	9059	2.54	170.24						
49	9060	12.45	14.75						
Murray									
No. 8	2164	0.01	15.16						
Murray									
No. 9	2162	0.01	22.61						
50	9064	1.973	158.43						
51	9070	0.18	154.20		5.66				
52	9072	0.05	35.33						
53	9073	3.79	375.73						
54	9074	7.73	95.79						
55	9080	11.28	440.10						
56	9081	0.66	27.46						
57	9088	3.62	137.33						
58	9090	3.15	152.72						
59	9092	0.08	102.36						
60	9097	30.48	30.54						
61	9100	38.29	446.11						
62	9101	1.29	20.87						
63	9102	5.32	508.12						
64	9107	0.04	31.02		32.15	10.4			
Midvale									
No. 1	1	0.01	15.3		3.2		34.56	14.44	
65	9109	1.46	91.29						
66	9110	14.55	93.13						
67	9115	0.03	27.5						
68	9125	0.32	7.53		10.17				
69	9129	5.306	111.75						
70	9130	2.35	19.78						
71	9131	1.13	114.53						
Tooele									
No. 1	361	0.23	106.19	Present.	2.6	4.71	79.74	4.40	Sulphur present
72	9132	0.43	24.21						
73	9133	4.25	195.91		7.1				
74	9136	59.32	419.51						
75	9138	1.17	15.48						
76	9143	12.43	21.29						
77	9148	3.92	78.16						
78	9157	0.07	47.41						
79	9158	0.03	24.01						
80	9159	0.03	27.69						
81	9161	4.12	265.0						
82	9163	0.03	22.47						
83	9175	3.26	263.19						
84	9177	0.10	181.3						
85	9184	5.08	123.62						
86	9192	5.02	845.68						
Midvale									
No. 2	1	0.02	19.40						
Midvale									
No. 3	2	0.03	33.37		50.85				
87	9207	3.42	329.19						
88	9212	0.02	42.98		4.5	3.7			
89	9213	0.02	132.0		9.3	12.2			
Murray									
No. 10	451	0.02	33.62						
Murray									
No. 11	450	0.04	22.56						
90	9216	30.31	1,622.99						
91	9217	6.46	560.84						
Murray									
No. 12	461	0.26	34.59		41.6				
Murray									
No. 13	462	0.17	65.48		64.2				
92	9222	2.59	15.55						
93	9225	1.05	115.24						
94	9226	6.54	82.90						
95	9229	0.03	30.24		2.18				
96	9230	0.10	106.37		12.1				
97	9210	0.07	29.77		41.06				
98	9238	2.46	176.34						
99	9239	6.21	197.53						
Midvale									
No. 4	31029	0.04	149.99		53.3				

					cent	cent	cent	cent
Midvale								
No. 5	31065	0.02	38.59		15.8			
100	9245	2.60	282.52					
101	9251	4.81	70.05					
102	9261	0.10	63.98		61.2			
103	9262	0.08	177.3		19.0			
104	9266	4.15	613.89					
105	9267	4.60	34.16					
106	9268	8.64	594.62					
107	9269	2.94	234.22					
108	9270	1.96	76.25					

**TABLE IV—STATEMENT OF CUSTOM ORES PURCHASED IN NEVADA
JULY, 1917, TO DECEMBER 31, 1920, INCLUSIVE**

Compiled From Reports to the State Assayer and to the State Ore Sampler

1. ELKO PRINCE MINING COMPANY

	<i>Customers</i>	<i>Tons</i>
July, 1917—December, 1917, inclusive	7	608.4
January, 1918—December, 1918, inclusive	4	72.5
January, 1919		57.5
April, 1919		65.0
May, 1919		20.0
July, 1919		45.0
August, 1919		21.0
October, 1919		19.0
Total for twelve months, 1919	2	227.5
May, 1920		18.0
June, 1920		49.0
Total for twelve months, 1920	1	67.0

2. GOLDFIELD CONSOLIDATED MINES COMPANY

January, 1918—December, 1918, inclusive	2	1,350.5
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3. MACNAMARA MINING AND MILLING COMPANY

January, 1919—June 1919, inclusive		5,692
July, 1919		978
August, 1919		692
October, 1919		281
November, 1919		689
December, 1919		693
Total for twelve months, 1919	8	9,025
January, 1920		949
February, 1920		917
March, 1920		942
April, 1920		853
May, 1920		910
June, 1920		1,307
July, 1920		1,103
August, 1920		1,402
September, 1920		1,545
October, 1920		1,878
November, 1920		1,077
December, 1920		1,607
Total for twelve months, 1920	30	14,490

4. MASON VALLEY MINES COMPANY

July, 1917—December, 1917, inclusive	15	115,128.669
January, 1918—December, 1918, inclusive	25	363,681.431
January, 1919		14,352.648
February, 1919		11,356.739
Total for twelve months, 1919	3	25,709.388

TABLE IV—Continued

5. NEVADA CONSOLIDATED COPPER COMPANY

	<i>Customers</i>	<i>Tons</i>
July, 1917—December, 1917, inclusive.....	1	172,556
January, 1918—December, 1918, inclusive.....	1	296,398
January, 1919.....		17,988
February, 1919.....		3,168
March, 1919.....		47
September, 1919.....		14,800
October, 1919.....		18,122
November, 1919.....		43,085
December, 1919.....		3,747
Total for twelve months, 1919.....	1	99,707

6. THE SILVERMINES CORPORATION

January, 1918—December, 1918, inclusive.....	18	4,448
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7. TONOPAH BELMONT DEVELOPMENT COMPANY

January, 1918—December, 1918, inclusive.....	4	24,250
January, 1919.....		6,065
February, 1919.....		5,458
March, 1919.....		6,223
April, 1919.....		5,436
May, 1919.....		5,507
June, 1919.....		6,222
July, 1919.....		8,446
August, 1919.....		3,727
October, 1919.....		1,797
November, 1919.....		3,608
December, 1919.....		4,126
Total for twelve months, 1919.....	12	56,610
January, 1920.....		3,077
February, 1920.....		3,078
March, 1920.....		3,204
April, 1920.....		3,578
May, 1920.....		2,359
June, 1920.....		2,020
July, 1920.....		2,088
August, 1920.....		1,320
September, 1920.....		1,160
October, 1920.....		1,426
November, 1920.....		1,651
December, 1920.....		2,417
Total for twelve months, 1920.....	19	27,328

8. UNION CONSOLIDATED MINING COMPANY

July, 1917—December, 1917, inclusive.....	2	608,362
January, 1918—December, 1918, inclusive.....	6	14,877,672
January, 1919—December, 1919, inclusive.....	2	24,796,396
January, 1920—December, 1920, inclusive.....	7	20,289,369

9. WEST END CONSOLIDATED MINING COMPANY

July, 1917—December, 1917, inclusive.....	14	7,271
January, 1918—December, 1918, inclusive.....	29	15,319
January, 1919.....		1,491
February, 1919.....		1,938
March, 1919.....		1,387
April, 1919.....		1,712
May, 1919.....		966
June, 1919.....		1,130
July, 1919.....		1,334
August, 1919.....		715
October, 1919.....		287
November, 1919.....		1,621
December, 1919.....		2,232
Total for twelve months, 1919.....	27	14,904
January, 1920.....		1,148
February, 1920.....		1,116
March, 1920.....		1,097
April, 1920.....		899
May, 1920.....		650
June, 1920.....		562
July, 1920.....		605
August, 1920.....		626
September, 1920.....		574
October, 1920.....		414
November, 1920.....		397
December, 1920.....		416
Total for twelve months, 1920.....	11	8,293

TABLE IV—*Continued*

10. WESTERN ORE PURCHASING COMPANY

	<i>Customers</i>	<i>Tons</i>
July, 1917—December, 1917, inclusive.....	155	20,028.729
January, 1918—December, 1918, inclusive.....	194	30,226.408
January, 1919.....		1,440.322
February, 1919.....		1,356.250
March, 1919.....		1,081.420
April, 1919.....		996.829
May, 1919.....		1,255.951
June, 1919.....		638.120
July, 1919.....		993.433
August, 1919.....		672.776
September, 1919.....		546.719
October, 1919.....		274.880
November, 1919.....		623.451
December, 1919.....		884.036
Total for twelve months, 1919.....	94	10,544.167
January, 1920.....		345.308
February, 1920.....		704.095
March, 1920.....		559.605
April, 1920.....		493.441
May, 1920.....		689.197
June, 1920.....		258.908
July, 1920.....		304.175
August, 1920.....		173.942
September, 1920.....		275.802
October, 1920.....		79.439
November, 1920.....		94.092
December, 1920.....		56.045
Total for twelve months, 1920.....	131	4,084.049



STATE OF NEVADA

BIENNIAL REPORT

OF THE

Nevada School of Industry

1919-1920

E. J. MILNE, Superintendent



CARSON CITY, NEVADA

STATE PRINTING OFFICE

: : : :

JOE FARNSWORTH, SUPERINTENDENT

1921

1102



ELKO, NEVADA, December 31, 1920.

HON. EMMET D. BOYLE, *Governor of the State of Nevada.*

DEAR SIR: I have the honor to submit for your kind consideration my report of the Nevada School of Industry for the years 1919-1920.

I shall hope to make brevity the distinctive feature.

This school was opened for the reception of the delinquent and incorrigible child by your proclamation June 15, 1915.

It has long been our contention that the more we treated and regarded a person, and more especially a child in the adolescence period, as unworthy, as a mistake, as an incorrigible and a criminal, the more likely we are to have one. This particular type of child quite readily accepts your estimate of him, and usually tries to live up to the reputation given him by you, frequently with marked success. This being true it also occurs to me that should you regard them as being unfortunate, misguided, misinformed, dependent and neglected, still having within them the spark of honor and manhood, the more likely they are to discover and nurture it into definite action. I cannot conceive of a more pitiable object than a child who has lost all faith in himself, who recognizes no friends and no future.

Our conception of our institution is a place of service rather than show; one of assistance rather than punishment. We must not regard too seriously *what* a child does but rather *why* he does. We are perhaps prone to dwell so much upon a boy's rather gloomy past that we cause him to forget there is a possible bright future. We have tried to remove, as far as possible, the stigma of penal from this institution—making it rather a big family conducted on the family unit or plan—realizing that in all families there are mistakes and discouragements, and ours is no exception; have tried to impress upon them that "Greatness comes not in never falling, but rising every time we fall," and by a practical application, or rather a democratic attitude toward mistakes, with a sincere disgust for evil and a recognition of virtue, we have met with more or less success on this plan the past two years.

I realize that rules and regulations to maintain discipline and laws must need be, but I am of the opinion that no law is greater than a boy, and either or all, if necessary, might be suspended that the best interest of the child be served.

The first thing for us to determine upon receiving a boy is whether he is normal, whether mentally or physically deficient; this being determined the treatment is safer and more effective.

No person can be treated or educated in a definite period. There seems to be a rather definite psychological time when the greatest service the institution can render—that of preparing a child to live better—comes, and such a critical period is well worth observing and considering.

TYPES

This institution, even though small, has the three quite separate and distinctive types of children to deal with: First, the person between the ages of 16 and 21, whose acts and crimes include felonies.

and their long lines of activities in these lines rates them as almost distinctively criminal; they pride themselves upon their daring deeds, and in their own "parlance" they think they are "hard-boiled."

The other type, persons of almost similar age, who are more accidental offenders; their past record is good, they assume their own name and share in great humiliation their membership in such a school; their lure of venture and romance has had an abrupt ending; their home never looked so inviting and alluring; they readily adjust themselves to the rules and regulations and seek earnestly for credits that they may return home and still make good.

The last group is the child of various chronological ages, but whose mental age never exceeds that of the normal child of 12 years. They are feeble-minded and it is almost wrong to place them in with boys of the first group, as it is a very serious question as to whether the ultimate benefit to them has been worth while.

Large States have different institutions for the more effective treatment of these groups, and all States and school districts have the graded school for the students of the various grades, but we are under the necessity of keeping all grades in the one institution with but little opportunity of segregation; and while it may not be a feasible plan it occurs to me that under proper and equitable arrangements such States as Idaho, Utah and Nevada might, with mutual advantage, so grade their work and institutions that these three types might properly be segregated and given a decided advantage without increasing the cost to any one State and yet would add materially to the efficiency and the ultimate results. This thought is perhaps worthy of further investigation.

IMPROVEMENTS

Plans and specifications having been drawn for a hospital for the school and the urgent necessity for same being very apparent, I would most respectfully urge sufficient appropriation for same. Under present conditions we are absolutely unable to segregate or isolate, and one case of contagious disease necessarily exposes the entire body of students and we are practically helpless.

SUPERINTENDENT'S COTTAGE

Plans also having been drawn for a cottage for the Superintendent and the advisability of said cottage being evident and essential, I would most respectfully advise immediate consideration of same. Under present conditions the family life of the Superintendent and any privacy in his home life is entirely wanting. The State, I feel sure, is not desirous of longer neglecting to recognize the wisdom of erecting such a cottage and eliminating this condition. I would urge only a very plain, modest cottage and entirely within bounds of reason, the cottage to be for service rather than for show.

POULTRY

Located as we are with limited tillable acreage, and without any water save that which is pumped by electric power, it occurs to me that devoting our energies to poultry-raising on a moderate scale will prove in this institution, as in many others, rather a profitable and desirable line to follow. I would therefore recommend an appropriation of \$1000 for the equipment and maintaining of said plant.

MANUAL TRAINING BUILDING

The appropriation of \$5000 appropriated by the last Legislature for the building and equipping of a manual training department, has been consumed. The building erected is one of three rooms and a cement basement, cement foundation and white brick, and makes a very attractive and useful building. Notwithstanding the extremely high price of labor and building materials we were able to complete the building and purchase \$500 worth of useful equipment, and still live within our appropriation. Much credit for same is due to E. O. Fields, superintendent of construction, who utilized a great deal of the boys' help at the school and supervised them in their work.

POPULATION

The number of boys having been committed to this institution since its opening, has been 82. There are at present 25 boys in attendance. The month of November is taken as a basis of this report.

Boys Committed During 1919-1920

There have been 41 boys received during the past two years, distributed as follows:

Committed by order of court.....	33
Paroled from State Prison.....	5
Returned voluntarily	3
	<hr/>
	41

Those committed during the past two years represent the following by counties:

Clark County	8
Lincoln County	6
Elko County	5
Washoe County	4
White Pine County	3
Ormsby County	2
Pershing County	2
Churchill County	1
Lyon County	1
Humboldt County	1
	<hr/>
	33
From State Prison	5
	<hr/>
	38

States Represented by Commitments

Nevada	8
New York	5
California	4
Missouri	4
Utah	3
Colorado	2
Idaho	2
New Mexico	2
Pennsylvania	1
Kansas	1
Ohio	1
Arizona	1
Oaklahoma	1
Wyoming	1
Oregon	1
Old Mexico	1
	<hr/>
	38

Both parents dead	4
• Father dead	7
Mother dead	4
Parents separated	4
	<hr/> 25
Their Nationalities	
American	16
Indian	4
Mexican	2
English	1
Dutch	1
Italian	1
	<hr/> 25
Escapes	
Escaped	8
Recaptured	6
	<hr/>
At large	2

PUNISHMENTS

There has been no corporal punishment applied in the Institution the past two years. On two occasions it was necessary to use some physical force to maintain discipline and quell sheer defiance and insubordination.

There was a period of one year, one month and 11 days without an attempt at an escape.

The Meditation Room has been used for a total of 40 days during the past two years. There have been seven boys sentenced by their own court. The longest period has been 7 days, or an average of 5 and 5-7 days each.

There was a period of 10 months and 12 days without an occupant for the Meditation room.

APPRECIATION

May I at this time take this means of extending sincere appreciation to the Governor, Emmet D. Boyle, Secretary of State, State Controller, State Auditor, Attorney-General and State Treasurer in general, and the Board of Government in particular, for their prompt, active and efficient interest in the school.

NEEDS FOR MAINTENANCE

An estimate for the amount required for the coming two years is herewith attached and made part of this report.

CONCLUSION

During the past two years there has been but one boy recommitted, thus we may safely assume that the effect of the school upon the boys has had a somewhat beneficial effect, and that our efforts have not been in vain, and inasmuch as results in saving boys for useful citizenship cannot be measured in dollars and cents we make humble appeal to the Governor, State Officials, and the Legislative Bodies for a liberal appropriation for the maintenance, instruction and improvement of the school, and most respectfully solicit your deepest interest in the boys—citizens of tomorrow.

Respectfully submitted,

E. J. MILNE,
Superintendent.

FINANCIAL

The appropriation of \$35,000 has been expended and distributed as follows:

Executive	\$745.84
Management	7,981.49
Education	3,087.84
Health	980.41
Commissary	9,587.70
Fuel, light and power	2,045.54
Clothing	1,300.24
Shoes	634.03
Laundry	274.25
*Transportation	2,522.98
*Automobile and upkeep	1,769.35
Miscellaneous	868.51
Farm and garden	710.83
Improvement and Repairs	2,101.35
Equipment	389.64

\$35,000.00

*Includes transportation of 38 cadets to school, return of 3 escapes, and all expense connected with investigations, etc.

*Includes \$840 applied on purchase of new Dodge car.

Does not include deficit of \$1,122.45, bills for December, 1920.

PRODUCTION

During the two years we have produced as follows:

Milk, 2,534 gallons at 23 cents per gallon	\$582.80
Hay, 28 tons at \$20 per ton	560.00
Eggs, 365 dozen at 60 cents per dozen	219.00
Spuds, 3,200 pounds at 3½ cents per pound	112.00
Veal, 550 pounds at 20 cents per pound	110.00
Chickens, 40 at 75 cents each	30.00
Turnips, 1,000 pounds at 3 cents per pound	30.00
Cabbage, 400 pounds at 3 cents per pound	12.00
Carrots and beets, 500 pounds at 3 cents per pound	15.00

\$1,670.80

ESTIMATES FOR THE YEARS 1921-1922

All estimates are based upon an average attendance equal to that of the month of November, 1920, that of 25 students, and cover a period of two years.

Salaries for 1921-1922

Superintendent, \$250 per month	\$6,000.00
First officer and teacher, \$125 per month	3,000.00
Farm supervisor, \$100 per month	2,400.00
Matron, \$65 per month	1,560.00
Chef and cook, \$100 per month	2,400.00
Manual Training Instructor, \$100 per month	2,400.00
Physicians, \$25 per month	600.00
Dentists, \$8.33 per month	200.00

\$18,560.00

General Expense, 1921-1922

Light and power at \$60 per month for 2 years.....	\$1,440.00
Equipment and supplies, Manual Training department.....	600.00
Food and substance, Commissary, \$400 per month.....	9,600.00
Gasoline and upkeep of auto, \$30 per month.....	720.00
Drugs	240.00
Farm implements	100.00
Coal for two years, 5 cars.....	2,500.00
Postage and stamps.....	200.00
Telephone and telegraph.....	300.00
School supplies	200.00
Laundry supplies and barn brooms.....	150.00
Seeds, including spuds.....	200.00
Transportation cadets estimated at 40.....	2,000.00
Return escapes, based on past two years actual cost.....	300.00

\$18,550.00**Clothing, 1921-1922**

Suits, 1 suit per boy per year for 2 years at \$15.....	\$750.00
Dress shoes, 1 pair per year per boy at \$4.50.....	225.00
Work shoes, 3 pairs per boy per year at \$4.50.....	675.00
Overalls, 4 pairs per year per boy at \$2.75.....	550.00
Shirts, 6 per year per boy for 2 years at \$1.50.....	450.00
Night shirts, 2 per year per boy for 2 years at \$1.50.....	150.00
Sox, 6 pairs per year per boy at 25 cents.....	100.00
Straw hats, 1 per year per boy at 40 cents for 2 years.....	20.00
Dress hats, 1 per year per boy for 2 years at \$3.....	150.00
Gloves, 2 pairs per boy per year for 2 years at \$1.....	100.00
Overshoes, 1 pair per boy per year at \$2.25.....	112.50
Ties, 2 ties per year per boy for 2 years at 35 cents.....	35.00
Garters, 2 pairs per boy per year for 2 years at 25 cents.....	25.00
Underwear, 4 suits per boy per year for 2 years at \$1.50.....	300.00
50 yards mercerized linen.....	26.00
3 dozen mercerized napkins.....	7.50
60 bath towels	40.00
60 yards unbleached crash toweling.....	15.00
1 bolt unbleached pillow-slip muslin.....	16.00
36 yards bleached sheeting, 72 inches wide.....	30.00
8 white bed spreads full size.....	15.00
40 cretonne bed spreads for dormitory beds.....	80.00
150 yards strong unbleached muslin.....	37.50
25 pairs blankets	100.00
4 dozen face towels.....	12.00
300 packages gold dust.....	100.00
300 packages borax chips	85.00
2 rugs for officers rooms.....	50.00
Electric light globes for 2 years.....	70.00
Miscellaneous items not enumerated.....	200.00

\$4,526.50**Athletic Equipment, Amusements, Magazines**

For motion pictures, baseball, basket-ball, swimming suits,
appropriate magazines, entertainments, records, rolls, etc. **\$500.00**

Miscellaneous Household Supplies

2 cases sapollo	\$13.50
2 cases chloride of lime.....	14.00
1 case candles	11.50
3 cases Dutch cleanser.....	12.00
6 push brooms	18.00
12 mop sticks	6.00
3 dozen house brooms.....	51.00
8 whisk brooms	2.80
8 galvanized pails	10.00
1 dozen scrub brushes	2.25
1 case bon aml.....	3.50
2 cases lye	11.00
20 lbs. Silver Gloss starch.....	3.50
4 cases toilet soap.....	19.00
6 cases toilet paper.....	60.00
100 lbs. sal. soda.....	4.50
8 cases Savon soap.....	44.00
4 dozen hair combs.....	12.00
4 dozen tooth brushes.....	12.00
12 quarts liquid blue.....	2.25
6 gallons cedar polish.....	15.00
Improvements and repairs	1,000.00
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	\$1,327.80

Office Supplies

For two years	\$200.00
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Superintendent's Cottage

Plans and specifications drawn up.....	\$5,000.00
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Hospital and Equipment

Plans and specifications drawn up.....	\$5,000.00
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Poultry Plant

Runs, equipment and stock.....	\$1,000.00
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RECAPITULATION

Salaries	\$18,500.00
General expenses	18,550.00
Clothing	4,526.50
Athletic equipment, amusements, etc.....	500.00
Miscellaneous household supplies	1,327.80
Office supplies	200.00
Superintendent's cottage	5,000.00
Hospital and equipment	5,000.00
Poultry plant	1,000.00
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Grand total asked for.....	\$54,664.30



STATE OF NEVADA

ANNUAL REPORT

OF THE

Department of Apiary Inspection

YEAR ENDING DECEMBER 31, 1920

GEO. G. SCHWEIS
State Apiary Inspector



CARSON CITY, NEVADA

STATE PRINTING OFFICE

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JOE FARNSWORTH, SUPERINTENDENT

1921



REPORT OF STATE APIARY INSPECTOR

The work of apiary inspection was carried on actively during the proper season in all those Nevada counties where bee-keeping is a permanent feature of the agricultural industry.

FOUL-BROOD CONDITIONS IN NEVADA

Taking the State as a whole, there is diminished evidence of the presence of European foul-brood. American foul-brood, however, is still prevalent to some extent in spite of active efforts to suppress this insidious disorder. No new centers of infection have appeared, and, taking the year as a whole, there has been a considerable decrease in the prevalence of the disease. Other bee diseases have become so rare that they have for the most part failed to come to the attention of the Inspector. One or two instances of that peculiar disorder known as the "Isle of Wight Disease" were noted, but the condition is not at all severe and there is no reason to expect any increase in the trouble.

There was very little damage done by winter-killing except in a few instances where colonies were lost or greatly injured because supplied with insufficient honey for overwintering. The temptation to strip every colony of all available honey was very great in the year 1918 because of the abnormally high prices paid for honey throughout America. Under these conditions a few Nevada bee-keepers removed more honey than was advisable, leaving the bees stores too small for successful wintering.

Some damage to colonies of bees by skunks was reported from time to time, but there has probably been less than the usual annoyance from this source, because for the last few years skunk pelts have brought high prices, and they have been trapped throughout the State.

There appears to have been an unusual amount of thievery from established apiaries. Reports to this effect have been coming in from nearly every section of the State. This is apparently due in part to the high price of food, especially sugar. But, unless there is improvement in the near future, stern measures will have to be taken to suppress the activity of the thieves.

EFFECT OF INSPECTION IN IMPROVING DISEASE CONDITIONS IN THIS STATE

Throughout his term of office the present Inspector has preferred to take the position that instruction is often more effective than enforcement of the letter of the law. In many cases it has seemed preferable to give instruction in methods of preventing and eradicating bee diseases, taking it for granted that any intelligent bee-keeper is quite as much interested as the Inspector in getting rid of disease. Where instruction has not proven promptly effective, a kindly warning has usually resulted in a marked improvement in conditions. Throughout the State the result of instruction in better bee-keeping by the Chief Inspector and his deputies has been to bring about more conscientious work and a higher standard of operations. There is every prospect at present that, if this policy is continued for a few years, bee diseases will

be kept under strict control and will in large measure finally be eradicated.

EFFECT OF QUARANTINE PROCLAMATION IN DECREASING BEE DISEASES

Much of the progress made in the last few years in Nevada bee-keeping has been due to a wisely conceived quarantine which has made it impossible to bring diseased apiaries or apiary material from California and other States to Nevada. In fact, it was alleged that every year certain unscrupulous bee men bought up diseased apiaries in California very cheaply and brought them over to Nevada, where they were sold at a sharp advance on the price paid. This line of activity was naturally disastrous to the bee-keepers of Nevada, but it has been completely eliminated by the quarantine law.

ATTITUDE OF NEVADA BEE-KEEPERS TOWARD THE QUARANTINE AND INSPECTION LAWS

Under the circumstances, it is not at all surprising that the Nevada bee-keepers are at present thoroughly united in their support of the present inspection law and quarantine regulation. Everywhere throughout the State we have found manifested a cheerful compliance with the spirit of the law. Conditions have improved so very greatly under the administration of the law and the quarantine ruling that no one now desires to return to conditions of previous years.

INSTRUCTIONAL WORK OF INSPECTOR AND DEPUTIES

One of the weaknesses of the bee-keeping industry in Nevada is the fact that there is practically only one highly important honey plant in the State—alfalfa. Nevada agriculture is largely devoted to stock-raising and there is of necessity a very large area of hay land, a little less than half of which is in alfalfa. When the alfalfa is in bloom it usually supplies an immense amount of honey. In many parts of the State, however, there are so few other honey-producing flowers in the spring that the bees scarcely do more than maintain themselves during this period and they must be fed whenever the spring weather is cold and inclement. The worst feature of the honey flow from alfalfa is in the fact that the alfalfa is cut before it comes into full bloom and the bees bring in alfalfa honey for only a brief period. To a certain extent this is true also of the honey flow from the second crop of alfalfa, although in midsummer many other plants supply a certain amount of honey, enabling the bees to make some stores between the first and second crops. In certain sections of the State, however, sweet clover grows in profusion on waste lands, particularly along river bottoms. It is usually looked upon as a weed by alfalfa raisers and is left severely alone. Honey from sweet clover is of high quality and forms so valuable an addition to the alfalfa honey that the Inspector and his deputies have advised bee-keepers everywhere in Nevada to scatter sweet-clover seed in suitable places, particularly on waste lands along streams and among light coverings of willows and similar shrubbery.

The Inspector has also been active in urging bee-keepers in the more inclement sections of Nevada to make a careful study of the possibility

of better winter protection of apiaries. Throughout the United States winter losses, due very largely to the lack of protection, are so severe that they form a heavy tax on the apiary industry. The lack of protection makes it all the more essential to leave sufficient stores of honey for successful wintering.

It has also been our policy to urge the improvement of apiaries in Nevada through the introduction of more Italian queens. It is only fair to say, however, that on the whole Nevada is not backward in this matter, and probably fewer of the old-fashioned black bees are kept in this State than in many other portions of the country.

Another point which has been urged during the past year is the fact that under present financial conditions there is need of great economy in apiary management. It will probably be many a long year before Nevada bee-keepers will obtain such prices for their honey as they received in 1918 and 1919. Still, even under the present conditions, good business management will make it possible to obtain remunerative prices for all the honey that can be raised in the State. This is due to the high quality of Nevada honey, which makes it possible to secure a good market price when inferior grades of honey will scarcely sell at all.

One point which has received a great deal of emphasis in the instructional work of the Inspector and his deputies has been the great importance of associating the name "Nevada" with honey produced in this State. Our light-colored fine-flavored honeys are purchased by outside buyers and shipped by them to other States and foreign countries, where they are only too frequently marketed as California honey. We have urged that every can of honey originating in Nevada should bear a neat label in which the words "Nevada Honey" would be the prominent feature. Every square of comb honey should be similarly labeled.

We have also thought it desirable to point to the possibility of a considerable increase in the number of apiaries and of colonies now found in the State. In the course of the past year many new apiaries have been founded, and we feel that there is still room for a considerable expansion of the industry. We do not feel, however, that it is at all desirable to publish inflated figures or to work up any "boom" in Nevada bee-keeping.

DEPUTIES AND THEIR WORK

Under Nevada conditions, where the farming regions lie in isolated valleys scattered here and there over an immense area, efficient apiary inspection would be wholly impossible, or at least its cost would be out of all proportion unless the work could be done largely through efficient deputies. From the beginning, therefore, the work of apiary inspection has been organized on such a basis. The inspectors chosen are all of them active bee-keepers, heavily interested financially in the industry. Each inspector has been paid a nominal salary for the time actually spent in connection with the work, and his actual field expenses have also been reimbursed. On the whole, however, it is only fair to say that the spirit of the deputy inspectors has been one of self-sacrifice, since the work has often been done at a time when they could ill afford to be absent from their own apiaries. Moreover, many of the

which they were appointed. The character of the organization is demonstrated by the following list of deputy inspectors:

O. E. Johnston, Yerington, Nevada, Deputy Inspector for Lyon and Douglas Counties.

Mr. Johnston reports a considerable improvement in disease conditions in 1920. There are, however, a few apiaries, particularly in Douglas County, where active efforts should be made in 1921 to eradicate the remaining European foul-brood. Mr. Johnston emphasizes the importance of requeening these infected apiaries with good Italian stock. There has been a fair increase in the number of new apiaries, particularly in the vicinity of Minden, where the owners report a prosperous season.

E. G. Norton, Fallon, Nevada, Deputy Inspector for Churchill County.

Heavy shipments of honey from Fallon, amounting to several carloads annually, make this one of the most important regions for bee-keeping in Nevada. Mr. Norton made a complete inspection and a thorough clean-up of all the apiaries in the county in midsummer, and he is very optimistic concerning prospects for the coming year.

J. I. Earl, Overton, Nevada, Deputy Inspector for Lincoln and Clark Counties.

Through the aggressive work of Mr. Earl, conditions in Clark County have improved so greatly that out of more than 1,000 colonies of bees only a half-dozen cases of American foul-brood were found. Mr. Earl reports that the quarantine regulation has been particularly effective in preventing the annual introduction of bee diseases from Utah. The continuance of the present system of quarantine and inspection will be of the greatest benefit to the industry in Clark County.

B. M. Guthrie, Reno, Nevada, Deputy Inspector for Washoe County.

One of the greatest difficulties with bee-keeping in Washoe County lies in the fact that there are so many "back-lotters" having from one to a dozen colonies in their back yards. It is a curious fact that these small and scattered units are almost invariably diseased. They evidently form a dangerous source of infection for larger apiaries on a commercial basis. Mr. Guthrie has shown great persistence and patience in locating these small units, and has shown both tact and firmness in cleaning them up. It seems very evident, however, that instruction such as will be possible through the recently organized Washoe County Bee-Keepers Association will lead to the same standards of efficient bee-keeping on the part of the owners of small units that are now becoming prevalent in the large commercial apiaries.

FINANCIAL REPORT

Under the peculiar conditions existing in Nevada it is evident that the expense of travel must be high and that a considerable share of the funds will be absorbed by this item. This was the case in the past year. The salaries of the Chief Inspector and his deputies naturally absorbed the larger portion of the available fund. On the other hand, all expenses such as office hire and the cost of clerical labor were

Salary of Chief Inspector.....	\$800.00
Salaries of Deputy Inspectors—	
J. I. Earl.....	28.00
C. E. Johnston.....	76.00
Labor—	
F. J. Severin.....	142.00
Fred Tholke.....	8.00
Traveling expense.....	434.67
Total expended.....	<u>\$1,488.67</u>
Balance, January 1, 1920.....	<u>\$1,566.67</u>
Total expenditures, 1920.....	<u>1,488.67</u>
Reversion.....	\$78.00

Respectfully submitted,

GEO. G. SCHWEIS,
State Apiary Inspector.

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